

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

2HD2056
558

S

INTERNATIONAL AGRICULTURE AND TRADE REPORTS

United States
Department of
Agriculture

Economic
Research
Service

RS-92-5
August 1993

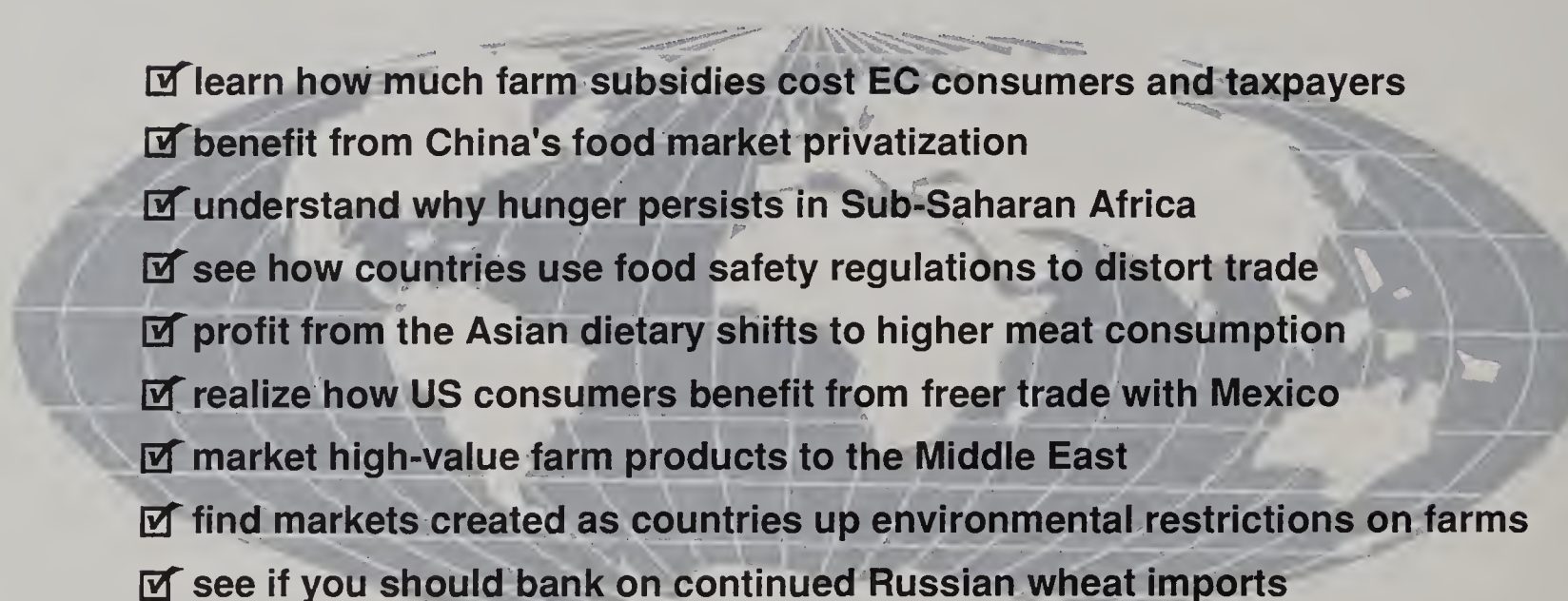
ASIA

Situation and Outlook Series



Asia's Long-Term Agricultural Trade Prospects: A Special Report

You need the *International Agriculture and Trade Reports* to:

- 
- ✓ learn how much farm subsidies cost EC consumers and taxpayers
 - ✓ benefit from China's food market privatization
 - ✓ understand why hunger persists in Sub-Saharan Africa
 - ✓ see how countries use food safety regulations to distort trade
 - ✓ profit from the Asian dietary shifts to higher meat consumption
 - ✓ realize how US consumers benefit from freer trade with Mexico
 - ✓ market high-value farm products to the Middle East
 - ✓ find markets created as countries up environmental restrictions on farms
 - ✓ see if you should bank on continued Russian wheat imports

This six-report series includes **Africa and the Middle East, Asia and the Pacific Rim, China, Europe, Former USSR, and Western Hemisphere**. USDA economists draw on original foreign source materials to explain how basic forces are changing agriculture and agricultural trade around the world. Each report anticipates short- and long-term production, consumption, and trade of the region's key commodities. Detailed analysis backs up forecasts on how agricultural policies and structure, as well as macroeconomic and trade policies, will affect world food and fiber markets. Each report includes consistent, up-to-date data bases on key agriculture and trade indicators.

Call toll free 1-800-999-6779

to subscribe from the
United States and Canada.
Other areas, call 703-834-0125
or fax 703-834-0110, or
order subscriptions from:
ERS-NASS, 341 Victory Drive
Herndon, VA 22070.

Subscription rates for *International Agriculture and Trade Reports* (WRS) are:

Mailed	1 year	2 year	3 year
Domestic	\$20	\$38	\$56
Foreign	\$25	\$47.50	\$70

Single copies are \$9.00 domestic, \$11.25 foreign.



United States
Department of
Agriculture

Economic
Research
Service

RS-92-5
August 1993

Report

Coordinator

Rip Landes
(202) 219-0705

Principal

Contributors

Lois Caplan
John Dyck
Ruth Elleson
Mark Giordano
Kim Hjort
Anwarul Hoque
Sophia Wu Huang
Rip Landes
Carol Levin
Liana Neff
Terri Raney
Shwu-Eng Webb

Technical and

Data Support

Yetta Lyle
Doug Parry
Mary Wright

Approved by the World
Agricultural Outlook Board.
Summary released June 18,
1993. The *Asia International
Agriculture and Trade Report*
is a special issue in the regu-
lar series of six regional re-
ports in the Situation and Out-
look series published by the
Economic Research Service.

Regular titles are *Europe, For-
mer Soviet Union, China, Asia
and the Pacific Rim, Western
Hemisphere, and Africa and
the Middle East*. Summaries
and report text may be ac-
cessed electronically through
the USDA CID system.

INTERNATIONAL AGRICULTURE AND TRADE REPORTS

ASIA

Situation and Outlook Series

Contents

Summary	3
Introduction	4
Background	
Asia's Expanding Role in Global and U.S. Agricultural Trade . . .	5
Agricultural Trade Prospects to 2000	
Bangladesh	20
China	27
Hong Kong	38
India	45
Indonesia	59
Japan	70
Malaysia	82
Pakistan	94
Philippines	106
South Korea	116
Taiwan	127
Thailand	136
Vietnam	145
Regional Overview	
Asian Agricultural Trade Prospects in the 1990's	151
List of Boxes	162
List of Text Tables	162
List of Text Figures	164

The global and country policy and commodity price assumptions do not include the potential impacts of a multilateral agreement to reform agricultural policy under the General Agreement on Tariffs and Trade (GATT) that may be completed during the 1990's. The impacts of a GATT agreement are not analyzed because the Uruguay Round negotiations remained in progress while the study was

being conducted. The United States remains committed to a successful conclusion to the Uruguay Round, including an agreement to significantly reform global agricultural trade. Analysis of the trade impacts of the completed Uruguay Round agreement will be the topic of future ATAD research.

Weights and Measures

The metric system of weights and measures is used in this report. The following are conversions to the U.S. system of weights and measures:

1 hectare (ha) = 2.47109 acres
1 kilogram (kg) = 2.204622 pounds
1 metric ton = 2,204.622 pounds

1 metric ton = 1.102311 short tons
1 metric ton of wheat or soybeans = 36.7437 bushels
1 metric ton of corn = 39.368 bushels
1 metric ton of rice = 22.04622 hundredweights
1 metric ton of cotton = 4.592962 480-pound bales

Acknowledgements

Appreciation is extended to the U.S. Agricultural Counselors, Attaches, and staffs of the Foreign Agricultural Service in Asia for their assistance in ERS's research and outlook programs. The contributors thank John Dunmore, Ed Overton, and Jerry Sharples of ERS, as well as reviewers from the World Agricultural Outlook Board and the Foreign Agricultural Service for their reviews and contributions. Appreciation is also extended to Diane Decker, Dixie Lee, and staff of the EMS Information Division for editorial and publication assistance.

Summary

Asia, the largest regional market for U.S. farm exports, is projected to show stronger import demand in the 1990's than in the 1980's. East Asian markets, where rising imports of value-added products will offset slowing demand for bulk commodities, will continue to account for most Asian farm imports. However, escalating farm imports, primarily bulk commodities, are likely in the rapidly developing economies of Southeast and South Asia. Declining exportable surpluses in China are also likely to increase opportunities for the United States and other exporters.

Asia presents both opportunities and challenges for U.S. agricultural trade in the 1990's. Asia now accounts for about 40 percent of U.S. farm exports, and stronger demand offers potential for increased farm exports. U.S. prospects are enhanced by faster projected growth in Asia's net import demand for wheat, coarse grain, soybeans, cotton, and meats—all commodities for which Asian markets are crucial to U.S. exporters. Challenges for U.S. exporters include boosting low U.S. market shares for some commodities in China and South and Southeast Asia, as well as coping with likely unstable growth in import demand in these regions.

Gains are projected in Asia's imports of most major farm commodities in the 1990's. For many commodities, particularly wheat, soybeans, and cotton, developments in China will be the key to future import growth. Asian commodity highlights are:

- Wheat imports are projected to grow about 3 percent annually in the 1990's, compared with 2.6 percent in the 1980's. Most wheat demand growth is projected to occur in China and, to a lesser extent, in South and Southeast Asia.
- Rice demand and imports are projected to continue slowing, while rice export growth quickens from 1.5 percent annually in the 1980's to about 3.5 percent in the 1990's.
- Coarse grain imports are projected to build more slowly in the 1990's. Slower growth in feed use in East Asia will be partially offset by rising demand in Southeast Asia. However, prospects for U.S. exports to Asia are likely to improve by 2000 due to shrinking exportable surpluses in China and Thailand.
- Demand for oilseeds and meals will also expand due to growing feed use and limited capacity to produce high

quality feed protein in most Asian countries. As with coarse grain, slowing East Asian demand will be countered by rising demand in Southeast Asia and, perhaps, China. China's exports of soybeans and meal are projected to fall sharply by 2000.

- Imports of beef, pork, and poultry meat are projected to remain strong. Asian meat import demand will continue to be driven by developments in East Asia, where the lifting of trade barriers combined with rising incomes initiated rapid growth in meat imports in the 1980's. Thailand and other Southeast Asian countries could become increasingly competitive pork and poultry exporters.
- Imports of edible oils are projected to strengthen due to increased imports by China and India and sustained growth in the rest of South and Southeast Asia. Exportable oil surpluses—primarily Southeast Asian palm oil—are projected to sustain strong growth, but not at the pace achieved in the 1980's.
- Import demand for raw cotton grew only 1 percent annually in the 1980's, and is expected to remain weak in the 1990's, as falling East Asian demand offsets growth in Southeast Asia. No increase in Asian cotton exports is projected, as most growth in Chinese and South Asian production is used to meet expanding domestic and export demand for textiles.

The 1990's outlook is sensitive to many factors, including Asian economic growth and potential trade reform involving agriculture. Import demand for wheat, feeds, meat, and value-added goods in China and South and Southeast Asia will be sensitive to income growth. Alternate scenarios for China indicate that the ongoing economic reforms could lead to significantly faster growth in wheat, coarse grain, soybean, and cotton imports than have been projected.

Market-oriented reforms, either unilateral or multilateral under GATT, are expected to lead to higher U.S. farm exports to the large and relatively protected East Asian markets. However, gains might be partially offset by increased competition for sales of corn, meat, cotton and, possibly, wheat from developing Asian countries, where internal prices are generally low. An Asian regional trade agreement involving East and Southeast Asian countries, while not likely, could increase intraregional farm trade and slow U.S. exports for commodities such as rice, coarse grain, and meat.

Introduction

This *Asia International Agriculture and Trade Report*, focusing on prospects for Asian agricultural trade in the 1990's, is a special issue of the regional situation and outlook reports published by the Agriculture and Trade Analysis Division. It represents a departure from the normal coverage of regional reports in two respects. First, its scope is all Asian countries, including the developed and newly industrializing countries of East Asia, and the developing countries of China and South and Southeast Asia. During 1988-92, coverage of these countries was divided among three regional reports, China, the Pacific Rim, and all developing economies. Second, the focus is on the outlook for Asian trade to the year 2000, in contrast to the shorter term focus of other regional outlook reports.

The rationale for a report focusing on Asian agricultural trade prospects in the 1990's is compelling. As highlighted in the lead article, Asia has emerged over the last three decades as the world's largest and fastest-growing market for agricultural commodities, and the largest and most dynamic U.S. market. Asian import demand contributed significantly to the surge in global and U.S. farm trade in the 1970's, as well as the sluggish performance of the 1980's. With more than half of the globe's population and most of its fastest growing economies, Asia is likely to remain a key factor in farm trade in the 1990's.

The report provides import demand projections for major commodities and countries, along with rigorous analysis of underlying technical and policy issues. Following the review of the region's role in agricultural trade, there are chapters on 13 major Asian countries, providing background and analysis of the issues shaping the outlook for the 1990's. Base projections representing expected outcomes are accompanied by analysis of the implications of alternative scenarios on key technical or policy variables in the outlook. Boxes within the text provide information on factors shaping supply, demand, and trade trends across the region. A closing chapter summarizes the region's 1990's outlook compared with the 1970's and 1980's.

The projections and scenario analyses in the report are based on the expertise and country modeling efforts of ATAD's regional analysts. The models employ explicit assumptions regarding supply and demand parameters and the evolution of domestic and trade policies in response to domestic and bilateral pressures, given assumed trends in world prices. Exogenous assumptions on income and population growth were taken from a consistent global macroeconomic framework. World commodity price assumptions are taken from an internally consistent global base scenario, while alternate country scenarios assume no impact on the base set of global prices.

The global and country policy and commodity price assumptions do not include the potential impacts of a multilateral agreement to reform agricultural policy under the General Agreement on Tariffs and Trade (GATT) that may be completed during the 1990's. The impacts of a GATT agreement are not analyzed because the Uruguay Round negotiations remained in progress while the study was being conducted. The United States remains committed to a successful conclusion to the Uruguay Round, including an agreement to significantly reform global agricultural trade. Analysis of the trade impacts of the completed Uruguay Round agreement will be the topic of future ATAD research.

Countries covered in the report are Bangladesh, China, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan, the Philippines, South Korea, Taiwan, Thailand, and Vietnam, with limited coverage of Myanmar. These countries accounted for 92 percent of Asia's farm imports (20 percent of global farm imports) and 98 percent of U.S. farm exports to Asia (42 percent of total U.S. farm exports) during 1988-1990. Commodity coverage generally included grains, oilseeds and products, meats, and cotton, which together accounted for 57 percent of total Asian agricultural imports and 69 percent of U.S. farm exports to Asia in 1988-1990. Major commodity groups excluded from the analysis are fruits and vegetables (10 percent of Asian agricultural imports in 1988-1990), beverages and tobacco (9 percent), sugar and honey (4 percent), and coffee, tea, cocoa, and spices (4 percent).

Asia's Expanding Role in Global and U.S. Agricultural Trade

Mark Giordano and Rip Landes

Abstract: Asia is a major market for agricultural commodities, receiving most of the increase in world and U.S. farm exports in the 1980's. The region is a large importer of bulk commodities, and a key source of the rising demand for value-added products. Economic growth, policy developments, and technical change will be important determinants of trade expansion in the 1990's.

Keywords: agriculture, trade, food grains, feeds, animal products, high value products, edible oil, cotton, Japan, China, Southeast Asia, South Asia, U.S. market share.

Introduction

Asian countries have been one of the largest, most consistent growth markets for both world and U.S. exports throughout the past 3 decades. Even during the 1980's slowdown in global income and trade expansion, Asia's import growth remained fast relative to most other regions of the world. Asia has emerged as the fastest growing regional market for agricultural commodities, accounting for the bulk of the increase in world and U.S. agricultural exports during the 1980's. The impressive import growth has been driven by the generally strong performance of Asia's varied and dynamic economies. Looking into the 1990's, it is likely that Asian markets will continue to play a key role in expanding opportunities for global and U.S. farm trade.

Asia's Importance in World Trade

Asian import growth has surpassed that of most other regions in each of the last two decades (table A-1). While many regions provided more rapidly expanding markets during the 1960's, by the 1970's growth in Asian trade exceeded most other regions—a key exception being North Africa and the Middle East where the oil boom temporarily fueled rapid expansion. In the 1980's, Asian import markets remained among the fastest growing in the world due, in large part, to rapid regional economic expansion. As a result of sustained growth, Asia's share of world trade has consistently increased since the late 1960's, and Asia now provides one of the world's primary export markets.

While Asia's agricultural imports have expanded less rapidly than total imports, they have consistently exceeded global growth (table A-2). In the 1980's, Asia became the dominant regional growth market for agricultural products. Asia has been the only region to consistently expand its share of world farm imports since the early 1960's. The increased prominence as an agricultural market is particularly evident when regional import data are adjusted to exclude intraregional trade (figure A-1). Particularly in contrast to Western Europe—where a large share of agricultural imports are from within the region, the bulk of Asia's agricultural imports originate with suppliers outside the region.

As its role in world farm trade has expanded, Asia has become increasingly important in a number of agricultural commodity markets (table A-3). Asian imports of beverages, tobacco, feed stuffs, and animal products have expanded most rapidly. In addition, Asia remains a major importer of wheat, coarse grains, textile fibers, and edible oils. Commodities where Asia's share of global imports is relatively small and declining are few, but include dairy and egg products and rice.

Growth in Asian import demand has varied sharply across countries in the region, reflecting relative economic performances, resource endowments, and trade policies (figures A-2 and A-3). Japan and the newly industrializing economies of East Asia have accounted for the bulk of Asia's import growth in both farm and non-farm commodities. However, import growth in other parts of the continent, particularly the rapidly expanding economies of middle income Southeast Asia, also has tended to exceed the world average. In some regions, including China and South Asia, relatively strong economic growth has not yet been accompanied by consistent expansion of total trade or agricultural trade at rates exceeding the world average.

Although most of Asia's farm imports are supplied by exporters outside the region, Asian exporters have been important suppliers of some commodities. Most rice is supplied within the region, and significant shares of Asian imports of vegetable oils, corn, pork, and poultry meat are met by suppliers within the region. In addition, a growing share of inputs for the region's large cotton textile industry is now met by Asian suppliers in the form of raw cotton or intermediate products, such as yarns and cloth.

Asia Emerges as Largest U.S. Market

With the expansion of Asia's role in global trade, the region has emerged as the second largest market for U.S. exports and the largest and most consistent market for farm products (table A-4). Asia is the only region to exceed the average growth rate of U.S. exports in each of the last 3 decades, and to consistently increase its share of U.S. exports. Also, Asia's share of U.S. farm exports expanded much more rapidly than any other region between the early 1960's and the late 1980's.

Table A-1. Trends in total merchandise trade by world region

	Total trade				Growth rates			Share of world			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----\$ billion-----				-----Percent-----						
World	133	281	1,697	2,789	11.2	19.7	5.7	100	100	100	100
Asia	19	37	272	550	10.4	22.1	8.1	14	13	16	20
North America	25	57	324	624	12.5	19.0	7.6	19	20	19	22
Latin America	7	13	75	51	8.7	19.3	-4.2	5	5	4	2
Western Europe	72	146	811	1,403	10.6	18.7	6.3	54	52	48	50
Oceania	3	6	27	47	9.4	16.5	6.4	2	2	2	2
Africa	2	5	30	6	12.2	19.1	-16.2	2	2	2	0
North Africa/Mid. East	2	8	92	58	21.4	27.0	-5.1	2	3	5	2
USSR/Eastern Europe	3	8	65	50	17.0	23.3	-2.8	2	3	4	2

Source: United Nations Trade Data Base

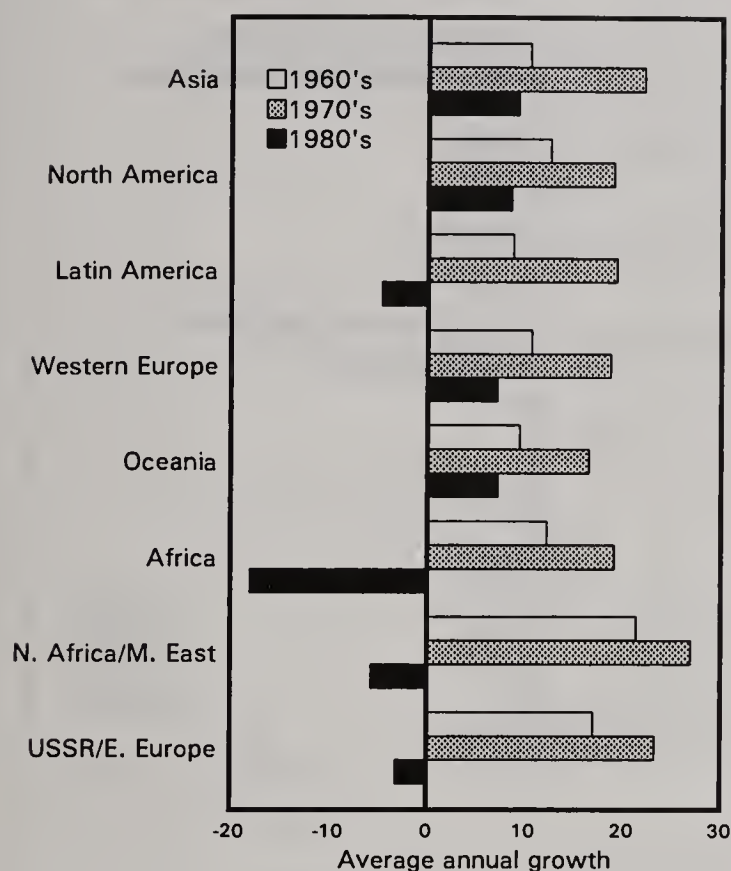
Table A-2. Agricultural imports by world region

	Agricultural imports				Growth rates			Share of world			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----\$ billion-----				-----Percent-----						
Including intra-regional trade											
World	34	49	206	276	5.4	15.4	3.3	100	100	100	100
Asia	6	8	36	60	5.5	16.0	6.0	16	16	17	22
North America	6	8	27	36	4.6	13.6	3.3	16	15	13	13
Latin America	1	2	8	5	5.7	18.1	-4.7	3	3	4	2
Western Europe	20	28	107	154	5.0	14.3	4.2	59	57	52	56
Oceania	0	0	2	2	6.4	14.8	4.9	1	1	1	1
Africa	0	1	4	1	10.2	17.3	-13.2	1	2	2	0
North Africa/Mid. East	0	2	15	10	18.8	25.4	-4.3	1	3	7	4
USSR/Eastern Europe	1	1	8	6	7.8	22.0	-3.3	2	2	4	2
Excluding intra-regional trade											
Asia	4	6	25	42	7.0	15.7	6.0	15	18	20	30
North America	4	6	20	24	4.1	13.1	2.2	18	18	16	17
Latin America	1	1	6	4	4.5	20.0	-5.5	3	3	5	3
Western Europe	14	16	51	52	2.3	12.2	.3	57	51	40	38
Oceania	0	0	1	2	5.3	14.3	4.9	1	1	1	1
Africa	0	1	4	1	9.9	18.6	-13.8	1	2	3	1
North Africa/Mid. East	0	1	14	10	17.6	25.9	-4.2	2	4	11	7
USSR/Eastern Europe	1	1	6	4	5.6	21.9	-4.0	2	3	5	3

Source: United Nations Trade Data Base

Figure A-1

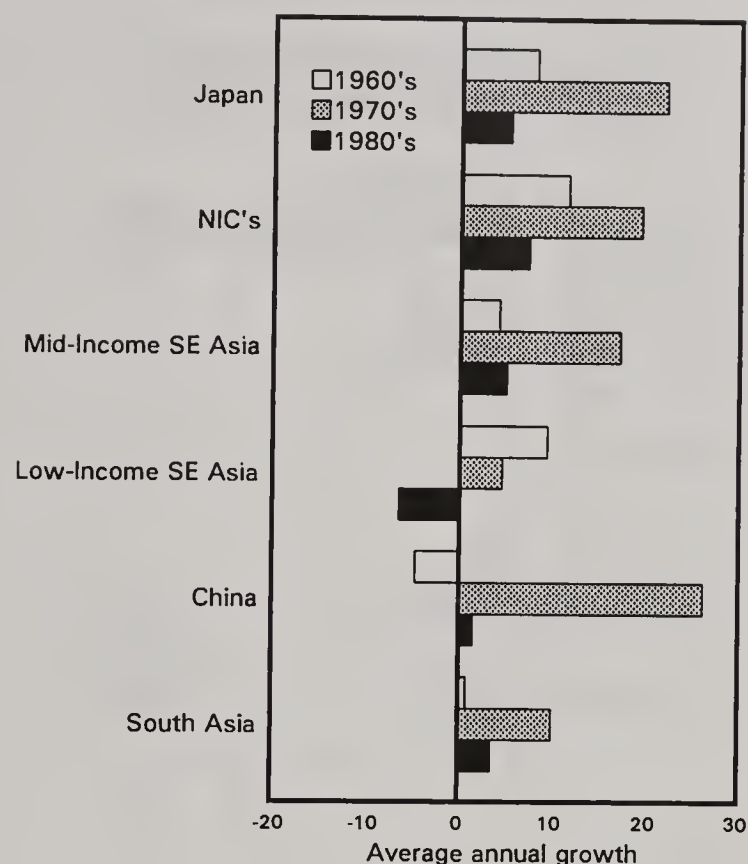
Growth of Agricultural Trade by World Region



Source: FAO; excludes intra-regional trade

Figure A-2

Growth in Asia's Farm Imports by Subregion



Source: FAO

Table A-3. Asia's farm trade by major commodity

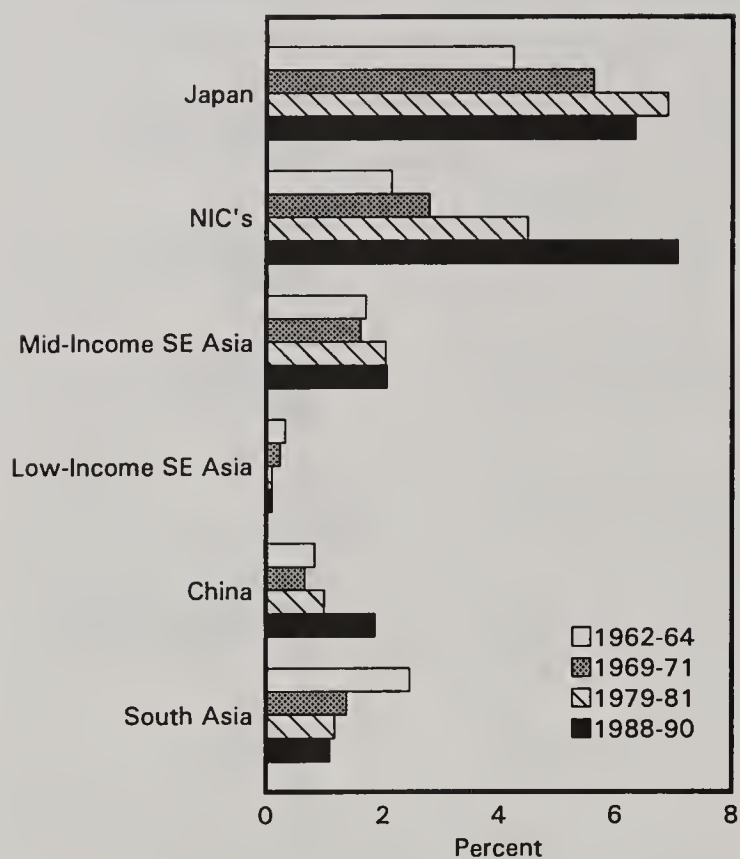
	Imports				Growth rates			Share of world			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----\$ billion-----				-----Percent-----						
Total agriculture/1	6,065	8,947	41,856	65,575	5.7	16.7	5.1	15	16	17	20
Animals and products	164	401	2,858	6,882	13.6	21.7	10.3	4	6	10	16
Dairy and eggs	233	305	1,310	2,197	3.9	15.7	5.9	14	12	10	10
Cereals and products	2,261	3,010	12,328	12,707	4.2	15.1	.3	32	33	26	27
Wheat and flour	1,248	1,339	5,523	5,683	1.0	15.2	.3	34	34	28	30
Rice	618	769	1,734	935	3.2	8.5	-6.6	62	60	31	20
Coarse grains	346	755	4,062	4,272	11.8	18.3	.6	17	24	22	28
Fruit and vegetables	307	639	2,997	6,842	11.1	16.7	9.6	6	8	10	13
Sugar and honey	399	533	2,877	2,702	4.2	18.4	-.7	15	18	18	15
Coffee/tea/cocoa/spices	188	355	1,804	2,634	9.5	17.7	4.3	5	6	8	11
Feeds	87	186	917	2,337	11.5	17.3	11.0	9	10	9	14
Beverages and tobacco	186	321	1,788	5,966	8.1	18.7	14.3	7	7	10	19
Textile fibers	1,287	1,591	5,872	8,002	3.1	13.9	3.5	23	31	41	43
Edible oils	166	294	2,522	3,250	8.5	24.0	2.9	12	13	23	24

Source: Food and Agricultural Organization of the United Nations

1/ Asian totals differ from table A-2 because of source differences.

Figure A-3

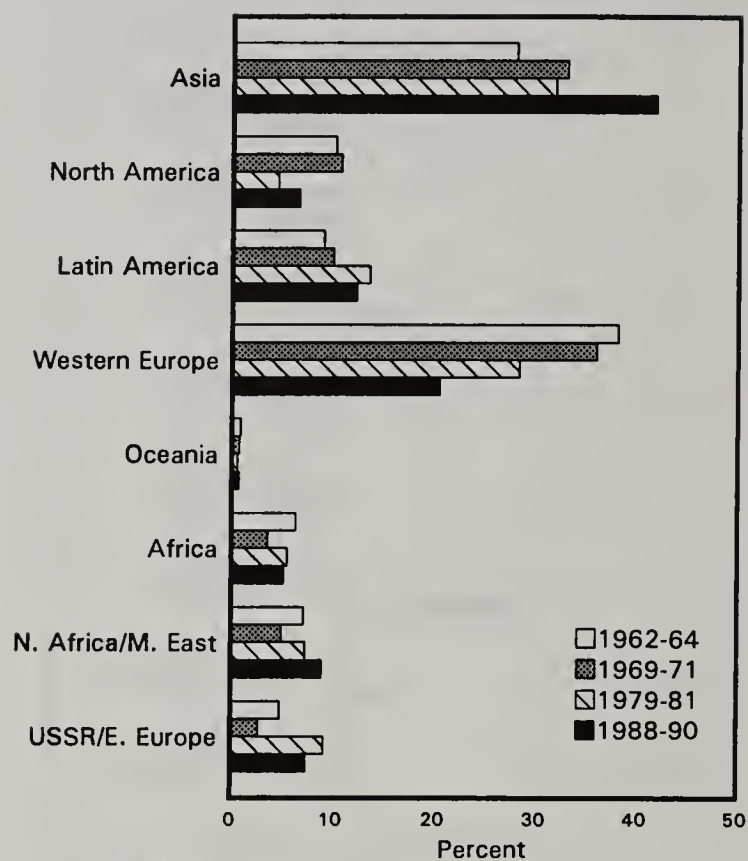
Asian Shares of World Agricultural Imports



Source: United Nations

Figure A-4

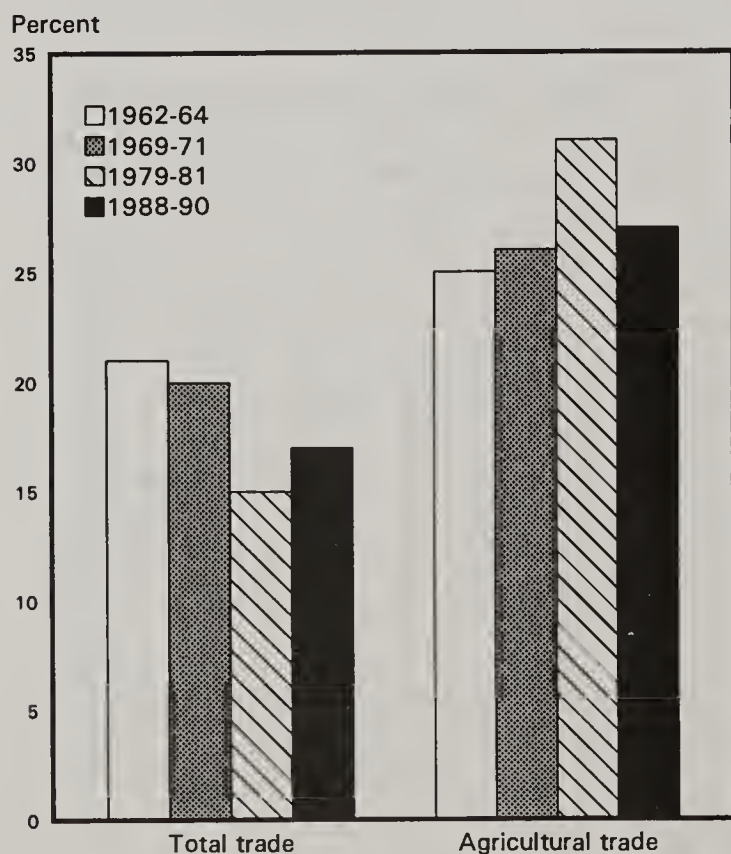
Shares of U.S. Farm Exports by Destination



Source: United Nations

Figure A-5

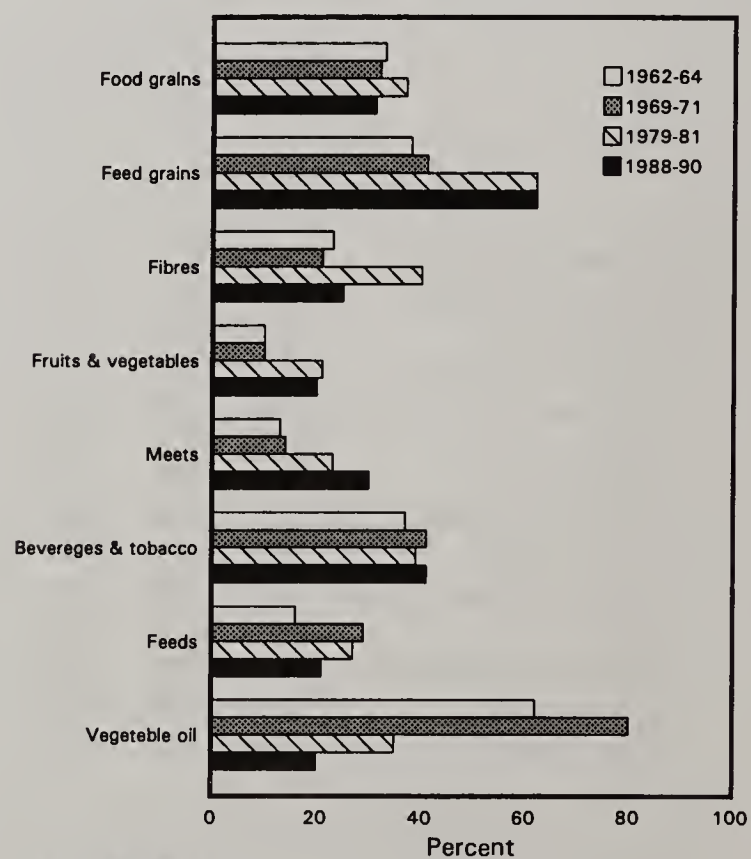
U.S. Market Share in Asia



Source: FAO and United Nations

Figure A-6

U.S. Market Shares in Asia by Commodity Group



Source: United Nations

Table A-4. U.S. total and agricultural exports by world region

	Exports				Growth rates			Share			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----\$ billion-----				-----Percent-----						
Total merchandise											
World	23.5	41.2	204.1	340.5	8.4	17.4	5.9	100	100	100	100
Asia	4.6	8.5	45.2	97.0	9.1	18.2	8.9	20	21	22	29
North America	5.2	11.4	53.4	88.5	11.9	16.7	5.8	22	28	26	26
Latin America	2.4	4.0	19.3	13.6	7.2	17.1	-3.8	10	10	9	4
Western Europe	8.2	14.2	66.1	103.4	8.2	16.6	5.1	35	35	32	30
Oceania	.6	1.2	5.5	10.2	10.0	16.3	7.2	3	3	3	3
Africa	.2	.5	2.9	.3	15.0	19.2	-22.7	1	1	1	0
North Africa/Middle East	.4	1.2	13.2	7.9	15.9	27.5	-5.5	2	3	6	2
U.S.S.R./Eastern Europe	.4	.3	3.0	1.9	-1.7	24.6	-4.9	2	1	1	1
Agricultural products											
World	5.8	7.2	40.9	42.7	3.1	19.0	.5	100	100	100	100
Asia	1.6	2.5	12.2	18.3	6.5	17.2	4.6	28	35	30	43
North America	.6	.7	4.5	6.3	4.2	19.8	3.8	10	10	11	15
Latin America	.4	.4	3.3	1.6	2.3	22.0	-7.9	7	6	8	4
Western Europe	2.4	3.0	13.1	8.5	2.8	16.1	-4.7	42	41	32	20
Oceania	.0	.1	.2	.4	1.8	15.1	5.9	1	1	1	1
Africa	.0	.1	.6	.1	8.7	21.7	-19.9	1	1	2	0
North Africa/Middle East	.1	.3	2.6	2.3	13.0	22.7	-1.6	3	5	6	5
U.S.S.R./Eastern Europe	.2	.1	1.3	.4	-7.8	25.3	-13.5	4	2	3	1

Source: United Nations Trade Data Base

During the 1980's, the Asian region accounted for the bulk of growth in U.S. exports of both farm and non-farm goods, far exceeding the contribution of any other region.

As a result of the sustained growth, U.S. exports to Asia now nearly equal those to Europe, traditionally America's largest market. Asia accounted for 29 percent of U.S. exports in the late 1980's (figure A-4). In agriculture, Asian markets now dominate U.S. trade. Asia surpassed Western Europe as the largest regional market for U.S. farm goods by the early 1980's, and expanded its share to 43 percent by 1988-90. Asia is now a critical market for some U.S. commodities, taking more than 75 percent of U.S. beef and pork exports, 65 percent of soybean oil and cotton exports, and 45 percent of wheat and corn exports.

Despite gains in U.S. trade to Asia, overall U.S. market share has not been strong (figure A-5). Although the U.S. market share for agricultural goods is higher than for all merchandise, it has remained near 25 percent over the past 3 decades. The lack of growth in market share—despite 13 percent annual growth in U.S. farm exports to Asia since the early 1960's—indicates even stronger growth in farm exports to Asia by non-U.S. suppliers. However, the United States maintains a strong market position in Asia for numerous commodities, including food and feed grains, meats, beverages, and tobacco (figure A-6).

Asia's Commodity Trade Patterns

The pattern of U.S. farm commodity trade in Asia has been dictated largely by the changing structure of the Asian economies, evolving agricultural policies, and the shifting comparative advantage of U.S. farm products. Since the 1960's, this combination of factors has benefited U.S. exports of commodities such as meats, fruits and vegetables, beverages, and tobacco, while dampening growth in more traditional exports such as wheat and rice (table A-5; figure A-7). Changes in competition, both within and outside Asia, have also affected U.S. agricultural exports.

Factors affecting U.S. trade in the region vary by commodity and, to a great extent, by the stage of development of the region's diverse economies. For the purpose of analyzing the trends in farm commodity trade, Asia is divided into six subregions, with each subregion reflecting a different mix of economic development and agricultural resource endowment. These subregions are Japan, the Asian newly industrialized countries (NIC's), middle income Southeast Asia, low income Southeast Asia, South Asia, and China.^{1/}

1/ The subregions are defined as 1) Japan; 2) NIC's: Hong Kong, Singapore, South Korea, and Taiwan; 3) middle income Southeast Asia: Brunei, Indonesia, Malaysia, Macao, the Philippines, Papua New Guinea, and Thailand; 4) low income Southeast Asia: Cambodia, Laos, Myanmar, and Vietnam; 5) South Asia: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka; and 6) China.

Table A-5. U.S. farm exports to Asia by major commodity

	Exports				Growth rates			Market share			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----\$ million-----				-----Percent-----						
Total agriculture	1,533	2,294	12,938	17,519	5.9	18.9	3.4	26	32	32	41
Animals and products	28	100	957	2,523	20.3	25.3	11.4	15	41	63	76
Dairy and eggs	47	47	4	80	-1.1	-21.6	39.2	20	15	0	4
Cereals and products	770	1,034	5,714	5,493	4.3	18.6	-1.4	34	34	46	43
Wheat and flour	550	479	2,449	2,289	-2.0	17.7	-1.7	44	36	44	40
Rice	73	187	332	34	14.3	5.9	-22.4	12	24	19	4
Coarse grains	130	325	2,826	3,053	14.0	24.2	.9	38	41	62	62
Fruit and vegetables	29	67	613	1,354	12.5	24.9	9.2	6	12	22	34
Sugar and honey	1	2	31	19	4.8	34.7	-5.4	0	0	1	1
Coffee/tea/cocoa/spices	17	5	63	128	-14.9	27.6	8.3	42	16	29	40
Feeds	13	54	248	491	22.1	16.4	7.9	15	29	27	21
Beverages and tobacco	70	131	701	2,449	9.5	18.2	14.9	13	19	27	43
Textile fibers	299	332	2,329	1,996	1.5	21.5	-1.7	23	21	40	25
Edible oils	103	234	879	650	12.5	14.1	-3.3	62	80	35	20

Source: United Nations Trade Data Base

Wheat Dominates Asian Food Grain Trade

While rice remains the food staple in most of Asia, Asian countries have not been a large or growing market for rice (table A-6 and figure A-8). As a region, Asia is a net rice exporter, with China, Thailand, Pakistan, and Vietnam joining the United States to supply the bulk of world rice exports. For most other Asian countries, rice imports typically provide only a small share of consumption needs.

Self-sufficiency in Asian rice economies stems from a comparative advantage in rice cultivation and, typically, from the importance of rice in domestic politics. In the case of the relatively high-income countries of East Asia, protection of high-cost producers is an important political priority. In the relatively low-income countries, including South Asia and China, maintenance of low internal prices for consumers, as well as conservation of scarce foreign exchange, are often top priorities. Relatively few countries have no significant barriers to rice trade.

Wheat is the second most important food grain in Asia, and one of the region's largest agricultural imports. Although wheat plays a subsidiary role to rice in most Asian diets, use is expanding in many countries as higher incomes and urbanization create preferences for convenient, wheat-based foods. In the relatively low-income countries of the region, wheat import demand is typically driven by growing middle classes and by wheat's low cost relative to rice in meeting food grain production shortfalls.

These factors led to rapid growth in Asian wheat imports, including U.S. wheat, by the higher-income Asian countries during the 1970's. In the 1980's, growth in Asian wheat imports and in U.S. exports to Asia slowed sharply. In higher-income countries, the slowdown reflected slower economic growth and increasing dietary diversity. In lower-income countries, improved domestic supplies and balance of payments constraints limited import demand.

Throughout the past three decades, U.S. wheat has been highly competitive in Asian markets, with the U.S. market share remaining near 40 percent throughout the period. However, the U.S. share fell during the late 1980's, particularly in Asia's relatively high income commercial markets. In large part, the downturn reflected strengthening price competition for commercial sales among leading wheat suppliers.

Growth in Feed Import Demand Slows

The feed-livestock sector has been one of the most dynamic in Asian agriculture in terms of domestic production and trade. Asia has been a major growth market for feeds—primarily coarse grains, oilseeds, and oilmeals—since the 1960's (figure A-9). Import demand is concentrated in the high- and middle-income countries of East Asia, where rising incomes have generated the most rapid demand growth for livestock products, and where capacity to produce feeds is limited (table A-7).

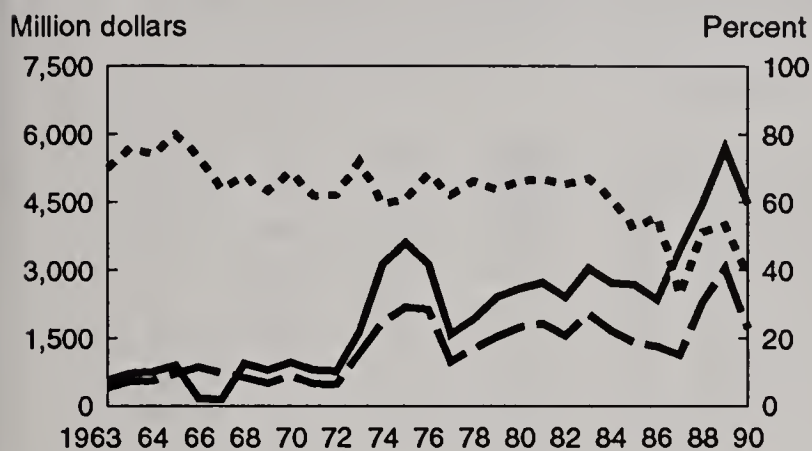
With the exception of South Asia, coarse grains—including corn, barley, sorghum, and millet—are used primarily for feed and account for the bulk of feed imports. During the 1960's and 1970's, rising meat production resulted in rapid growth in coarse grain imports. In the 1980's, however, growth in

Figure A-7

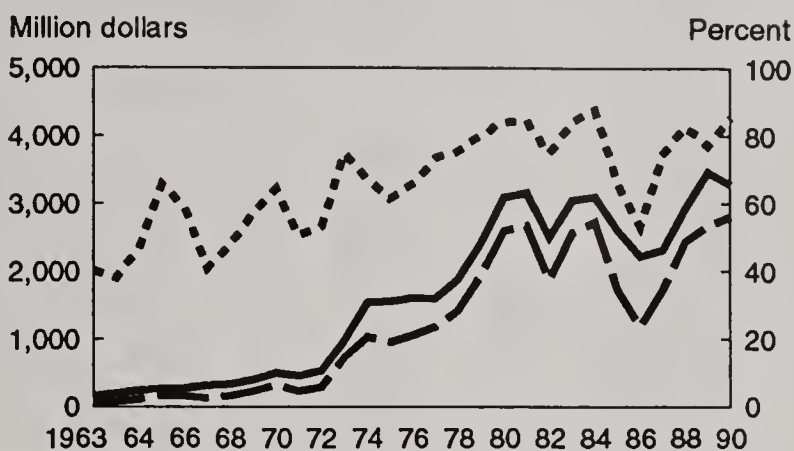
Trends in Asian Agricultural Imports

Imports — (Left scale) U.S. exports — (Left scale) U.S. market share - - - (Right scale)

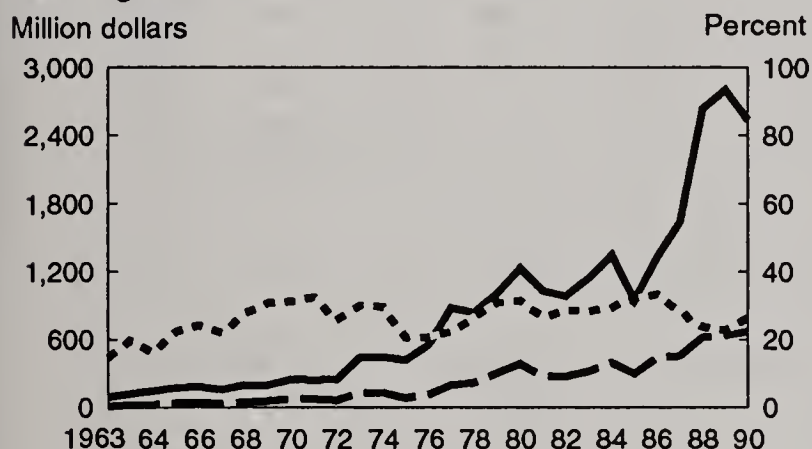
Wheat



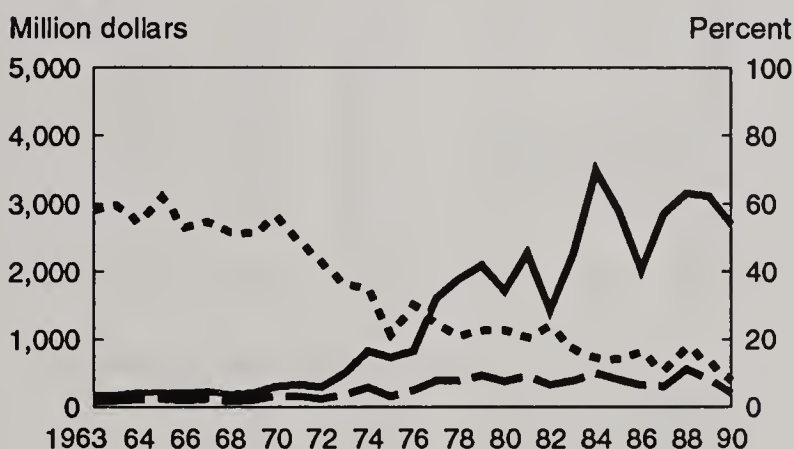
Corn



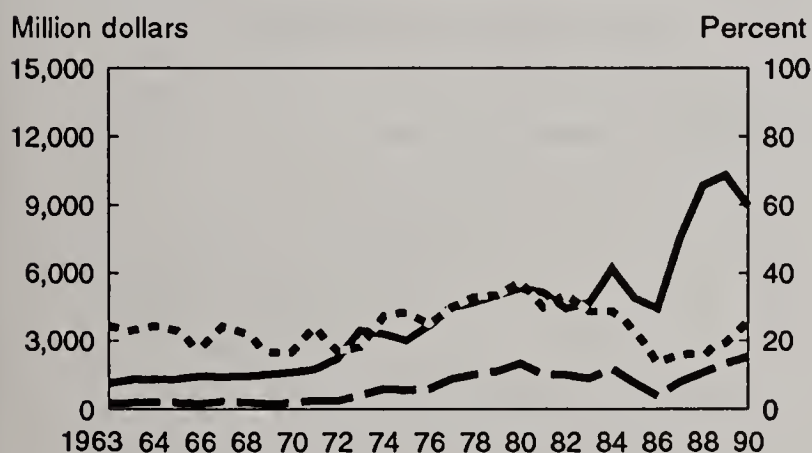
Feeding stuffs



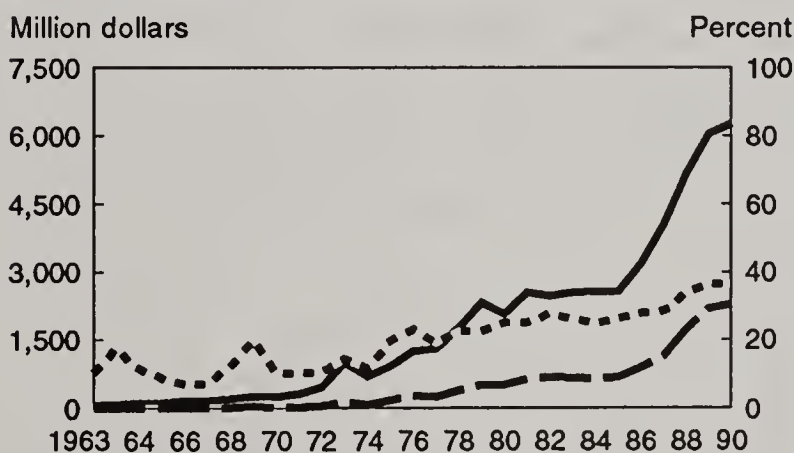
Edible oils



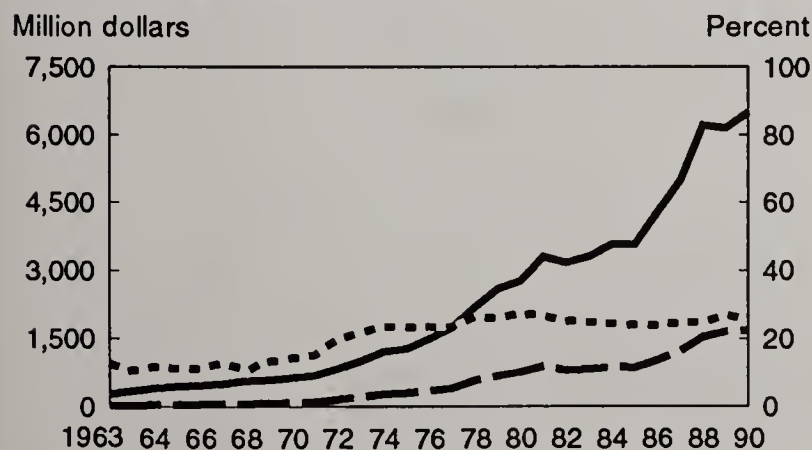
Textile fibers



Meats and preparations



Fruit and vegetables



Beverages and tobacco

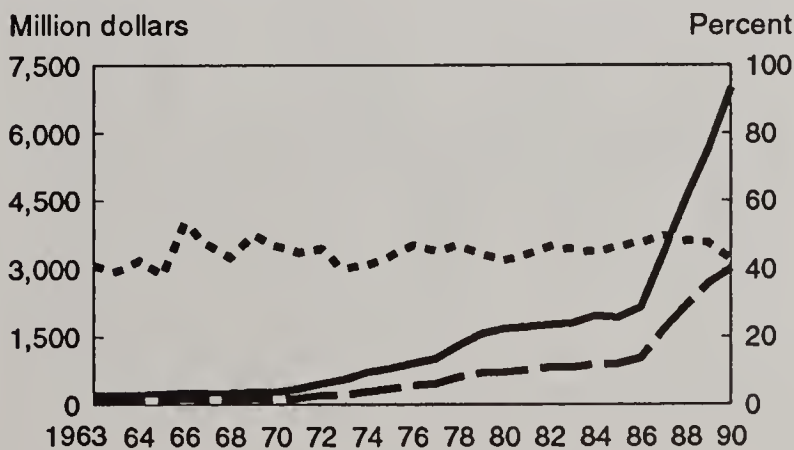


Table A-6. Asian trade in food grains by subregion

	Imports				Growth rates			U.S. exports			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----Thousand tons-----				-----Percent-----			-----Thousand tons-----			
Wheat											
Asia	16,361	18,172	27,253	34,048	1.5	6.0	3.2	8,231	7,797	13,497	15,562
Japan	3,198	4,628	5,747	5,592	5.4	2.2	-.3	1,374	2,424	3,182	2,797
NIC's	1,235	2,564	3,072	4,537	11.0	1.8	4.4	952	1,806	2,588	2,649
Mid-income SE Asia	790	1,441	2,763	4,267	9.0	6.7	4.9	241	701	1,643	1,359
Low-income SE Asia	180	747	1,333	229	22.5	6.0	-17.8	20	205	24	--
South Asia	5,997	4,770	3,420	5,287	-3.2	-3.3	5.0	5,643	2,660	1,275	3,006
China	4,960	4,021	10,919	14,136	-3.0	10.5	2.9	0	0	4,785	5,752
World	49,144	53,721	95,250	110,833	1.3	5.9	1.7	19,417	16,358	36,630	35,241
Rice											
Asia	5,020	5,127	4,786	3,295	.3	-1.0	-5.2	499	802	854	177
Japan	314	60	35	17	-21.1	-5.3	-7.8	35	1	1	1
NIC's	823	1,437	1,803	601	8.3	2.3	-11.5	0	416	663	16
Mid-income SE Asia	1,771	1,181	1,857	915	-5.6	4.6	-7.6	185	320	189	76
Low-income SE Asia	483	1,059	459	178	11.9	-8.0	-10.0	0	0	0	66
South Asia	1,570	1,386	457	1,061	-1.8	-10.5	9.8	278	65	1	19
China	59	3	174	524	-33.4	48.0	13.0	0	0	0	--
World	7,614	8,317	13,017	12,689	1.3	4.6	-.3	1,194	1,736	2,861	2,631

Sources: Import data: Food and Agricultural Organization of the United Nations; export data: U.S. Bureau of the Census

-- = less than 500 tons

Figure A-8

Asian Rice Imports and Exports

Million tons

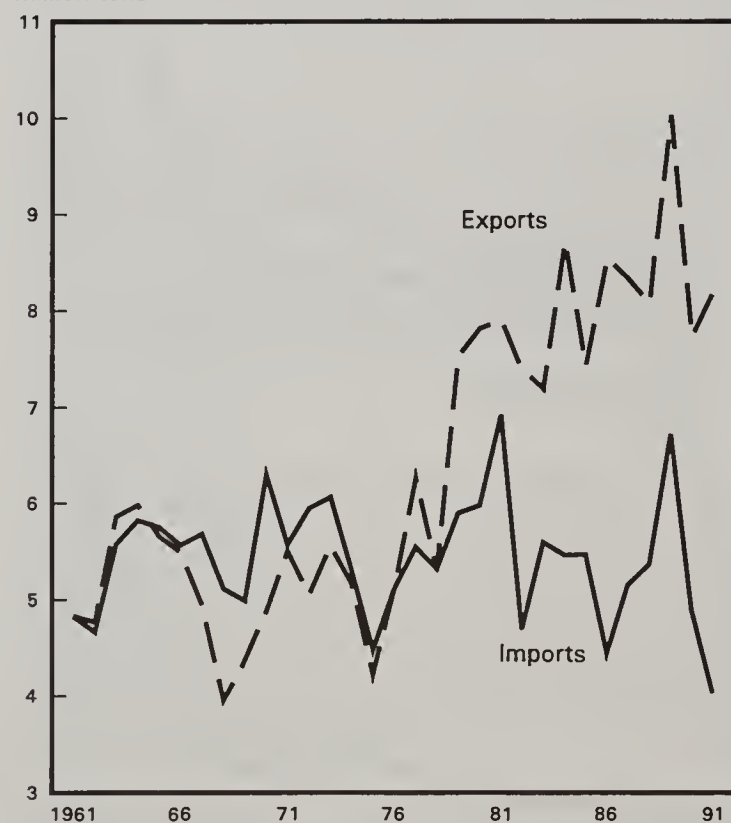


Figure A-9

Asian Coarse Grain Imports and Exports

Million tons

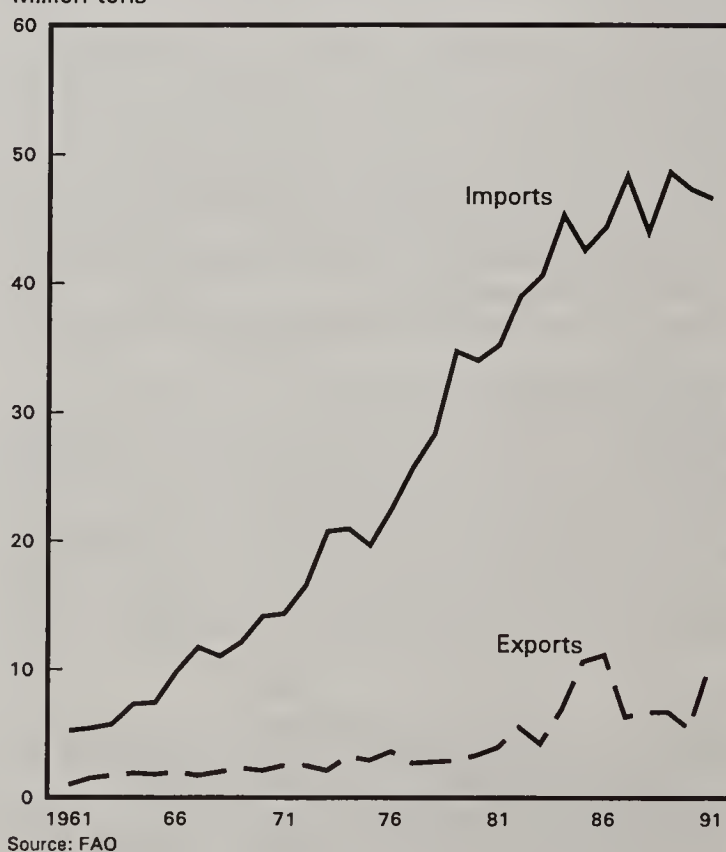


Table A-7. Asian trade in feeds by subregion

	Imports				Growth rates			U.S. exports			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----Thousand tons-----				-----Percent-----			-----Thousand tons-----			
Coarse grains											
Asia	5,440	12,095	28,953	36,031	12.1	13.3	3.2	2,432	5,740	19,725	22,570
Japan	3,698	10,060	18,737	21,857	15.4	6.4	1.7	2,038	5,106	13,660	13,089
NIC's	467	1,396	7,403	11,952	16.9	18.2	5.5	247	410	4,474	9,073
Mid-income SE Asia	109	312	940	1,572	16.3	11.7	5.9	10	20	139	110
Low-income SE Asia	67	96	7	3	5.3	-23.4	-7.9	36	83	0	0
South Asia	101	151	32	138	6.0	-14.4	17.7	101	121	19	151
China	999	80	1,834	509	-30.3	36.8	-13.3	0	0	1,433	147
World	33,817	46,873	109,673	105,694	4.8	8.9	-.4	15,979	17,503	64,669	56,980
Oilmeals											
Asia	167	484	1,318	3,611	16.4	15.4	15.5	16	125	253	189
Japan	75	295	310	781	21.7	.5	10.8	8	59	181	32
NIC's	51	77	441	1,266	6.0	19.1	12.4	0	19	43	26
Mid-income SE Asia	40	103	557	1,502	14.6	18.3	11.7	7	46	29	121
Low-income SE Asia	--	1	0	0	15.4	-100.0	**	0	0	0	0
South Asia	1	8	10	45	27.2	2.7	17.9	1	1	0	2
China	0	0	0	16	**	**	**	0	0	0	9
World	7,130	11,940	25,404	38,990	7.6	7.8	4.9	1,446	3,742	6,912	5,288
Oilseeds/1											
Asia	2,873	5,154	8,675	11,858	8.7	7.7	4.6	1,558	N/A	6,033	6,290
Japan	2,253	4,211	5,827	6,942	9.3	3.3	2.2	1,385	N/A	3,835	3,485
NIC's	297	723	1,795	3,514	13.6	9.5	8.8	166	N/A	1,460	2,580
Mid-income SE Asia	85	51	401	1,028	-6.9	22.8	12.5	7	N/A	259	216
Low-income SE Asia	22	5	0	0	-19.1	-100.0	**	0	N/A	0	0
South Asia	204	155	75	224	-3.8	-6.9	14.6	0	N/A	0	9
China	12	8	576	150	-5.5	53.1	-15.4	0	N/A	479	--
World	11,443	17,587	33,759	36,890	6.3	6.7	1.1	5,247	N/A	22,703	16,680

Source: Import data from the Food and Agricultural Organization of the United Nations, export data from the U.S. Bureau of the Census

-- = less than 500 tons

** = Incalculable value

N/A = Not available

/1 1988-1990 import data are for 1988 only.

imports was halted by slower economic growth, and a shift to meat imports by higher income countries—particularly Japan. Coarse grain imports are beginning to rise in middle-income Southeast Asian countries with limited production capacity, but remain small relative to East Asian imports.

The United States has been the dominant supplier of Asian coarse grain imports. During the 1980's, although growth in U.S. exports to the region slowed, the U.S. market share remained above 60 percent. To some extent, U.S. corn exports to Asia have competed with regional suppliers, including Thailand and China. Despite this competition, the United States maintains a higher market share in Asia for coarse grains than for any other commodity.

Japan and the NIC's are also the dominant importers of oilseeds and meal in the region. However, livestock sector expansion also led to rapid growth in oilseed imports in Southeast Asia during the 1980's. Imports of oilmeals have become increasingly important relative to oilseeds since the 1960's, but increased Asian crushing capacity portends a change in this trend. Overall, growth in Asian oilseed and meal imports slowed in the 1980's, but remained stronger than growth in demand for feed grains. The expansion of meal demand in the middle-income countries of Southeast Asia was particularly impressive.

Table A-8. Asian trade in live animals and meats by subregion

	Imports				Growth rates			U.S. exports			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----\$ million-----				-----Percent-----			-----\$ million-----			
Live animals and meats											
Asia	125	383	3,027	7,262	17.4	34.4	13.3	28	100	957	2,523
Japan	38	178	1,780	4,910	24.6	25.9	11.9	6	28	447	1,572
NIC's	51	153	1,022	1,943	17.1	20.9	7.4	20	70	499	918
Mid-income SE Asia	27	41	203	315	5.9	17.5	5.0	1	2	10	24
Low-income SE Asia	0	4	2	2	43.2	-8.7	.0	0	0	0	0
South Asia	2	0	2	57	-42.3	52.7	42.5	0	0	0	7
China	7	7	18	36	1.3	9.6	7.7	0	0	1	2
World	3,809	6,797	27,625	41,947	8.6	15.1	4.8	186	247	1,528	3,334

Sources: Import data: Food and Agricultural Organization of the United Nations; export data: U.S. Bureau of the Census

Table A-9. Trends in Asian meat trade

	Imports			Growth rates	
	1969-71	1979-81	1989-91	1970's	1980's
	Million tons			Percent	
Beef					
Imports	.10	.32	.85	12.3	10.3
Exports	.01	.04	.17	14.9	15.6
Pork					
Imports	.09	.26	.58	11.2	8.4
Exports	.14	.15	.44	.7	11.4
Poultry					
Imports	.05	.18	.66	13.7	13.9
Exports	.02	.07	.30	13.3	15.7

Source: Food and Agricultural Organization of the United Nations

The U.S. share of Asian feed imports other than coarse grains—primarily oilseeds and meals—is low relative to coarse grains and has declined despite consistent growth in U.S. exports to the region. The U.S. share of the oilseed market dropped from a 1980's high of 70 percent to about 53 percent at the end of the 1980's, due primarily to increased competition from South America, Canada, and China. There has been a similar decline in the U.S. share of Asia's oilmeal imports due to competition from South America, China, and India.

Animal Product Imports Respond to Rising Incomes

Most Asian countries have developed domestic livestock industries based on imported feeds, rather than relying on direct

imports of animal products. Domestic production is often encouraged as a matter of policy to boost rural employment and conserve foreign exchange, as well as for efficiency reasons. Animal product imports are dominated by meats, although dairy product imports are also significant and growing. Beef is now the major meat import in Asia, followed by pork—preferred by the Chinese population—and poultry (tables A-8 and A-9).

Import growth for meats has remained very strong throughout the past 3 decades. Despite rapid expansion of production, Japan and South Korea are the largest and fastest-growing Asian markets for meat products. Meat imports have been driven by insufficient domestic production capacity for the broad array of products demanded, as well as by the opening of these markets to foreign competition. U.S. exports to East Asian markets have also shown strong growth, with the U.S. share of the region's livestock product market rising steadily to about 30 percent by the end of the 1980's. Imports by middle-income Southeast Asian countries are relatively small, but are also expanding.

Since the late 1970's, the potential for U.S. meat exports to Asia has been affected by the emergence of Asian suppliers. A significant share of Asian demand for meat imports has been met by Taiwan (pork) and Thailand (poultry). Although Taiwan has plans to reduce pork exports because of environmental concerns, Thai poultry sales continue to expand, and Malaysia and Indonesia are emerging as potentially significant meat exporters.

High-Value Products Trade Expands Rapidly

Several categories of high-value products, including fruits, vegetables, beverages, and tobacco and products, have generated some of the highest growth rates in the region since the 1960's (table A-10). Fruits and vegetables, including citrus, apples, grapes, and raisins, are the third largest category of Asian agricultural imports, and one of the fastest expanding areas for U.S. exports. Though imports slowed in the 1980's,

Table A-10. Asian trade in selected high-value products by subregion

	Imports				Growth rates			U.S. exports			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----\$ million-----				-----Percent-----			-----\$ million-----			
Beverages and tobacco											
Asia	185	320	1,786	5,956	8.1	18.8	14.3	70	131	701	2,449
Japan	43	97	742	2,790	12.2	22.6	15.9	29	47	308	1,398
NIC's	56	113	616	2,349	10.6	18.5	16.0	20	33	261	906
Mid-income SE Asia	58	80	302	529	4.7	14.2	6.4	12	36	128	110
Low-income SE Asia	8	10	1	6	2.4	-19.3	19.2	5	13	0	0
South Asia	4	5	109	235	3.1	37.3	8.8	0	0	1	18
China	16	15	16	48	-.8	.8	12.6	4	2	4	17
World	2,846	4,596	18,533	32,072	7.1	15.0	6.3	528	708	2,638	5,726
Fruits and vegetables											
Asia	306	637	2,993	6,831	11.1	16.7	9.6	29	67	613	1,354
Japan	83	300	1,497	3,649	20.0	17.4	10.4	13	43	381	861
NIC's	104	193	1,021	2,130	9.3	18.2	8.5	10	19	201	401
Mid-income SE Asia	40	49	275	442	3.0	18.9	5.4	5	4	25	66
Low-income SE Asia	3	4	0	1	2.1	-23.8	20.8	0	0	0	0
South Asia	7	4	34	82	-7.9	23.8	10.4	0	0	0	1
China	69	88	166	525	3.7	6.5	13.6	0	0	6	24
World	4,751	7,650	30,511	53,350	7.0	14.8	6.4	457	579	2,790	4,026
Coffee/tea/cocoa/spices											
Asia	184	351	1,798	2,609	9.7	26.3	5.5	17	5	63	128
Japan	60	140	1,011	1,421	12.7	21.9	3.9	15	3	36	65
NIC's	46	87	348	746	9.5	14.9	8.8	1	2	21	48
Mid-income SE Asia	24	42	195	112	8.1	16.6	-6.0	1	1	5	15
Low-income SE Asia	1	0	0	0	-12.1	-10.9	-100.0	0	0	0	0
South Asia	2	1	62	68	-8.1	48.1	1.0	0	0	0	0
China	50	81	182	261	7.3	8.4	4.1	0	0	0	0
World	3,935	5,550	23,555	24,106	5.0	15.6	.3	40	34	213	317

Sources: Import data: Food and Agricultural Organization of the United Nations; export data: U.S. Bureau of the Census

Asia remained the fastest growing fruit and vegetable market for both world and U.S. exports. The high-income countries of East Asia are the primary regional importers, but increasing shortages of pulses have led to fast growth in South Asian imports of vegetables, primarily pulses.

Growth in Asian imports of beverages and tobacco has also been robust, making Asia the second largest regional market in the world following Western Europe. Tobacco and products account for 65 percent of the value of high-value product trade, and Japan and the NIC's are the primary importers. Even during the 1980's, growth in Asian beverage and tobacco and product imports slowed only slightly and far exceeded the world average. As a result, Asian imports more than tripled during the 1980's, reaching \$6 billion in 1988-90. Beverages and tobacco are a leading category of U.S. farm

exports to Asia, and the U.S. market share has been relatively stable near 40 percent since the 1960's.

Textile Fiber Trade Patterns Shift

Asia is the world's largest importer and producer of textile fibers and accounts for more than two-thirds of U.S. raw cotton exports. Within Asia, China, Pakistan, and India are major producers. Japan and the NIC's—with no domestic cotton production and expanding domestic and foreign markets for textiles—have historically accounted for most imports (table A-11). During the 1980's, however, growth in East Asian raw-cotton demand slumped, and the middle-income Southeast Asian countries—also with limited cotton production and increasingly competitive textile export sectors—emerged as the fastest growing markets in the region. At the

Table A-11. Asian trade in cotton by subregion

	Imports				Growth rates			U.S. exports			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----Thousand tons-----				-----Percent-----			-----Thousand tons-----			
Asia	1,258	1,528	2,545	2,814	2.8	7.6	1.4	496	532	1,253	1,321
Japan	667	733	718	704	1.4	-.2	-.2	233	157	298	330
NIC's	241	402	757	1,016	7.6	6.5	3.3	144	199	486	401
Mid-income SE Asia	53	94	235	604	8.5	9.6	11.1	46	95	137	173
Low-income SE Asia	13	27	41	59	10.9	4.6	4.0	12	23	0	0
South Asia	179	179	57	107	.0	-10.8	7.4	61	57	13	18
China	105	94	737	324	-1.6	22.9	-8.7	0	0	318	399
World	3,692	3,924	4,673	5,346	.9	1.8	1.5	1,017	719	1,528	1,510

Sources: Import data: Food and Agricultural Organization of the United Nations; export data: U.S. Bureau of the Census

Figure A-10

Asian Cotton Imports by Subregion

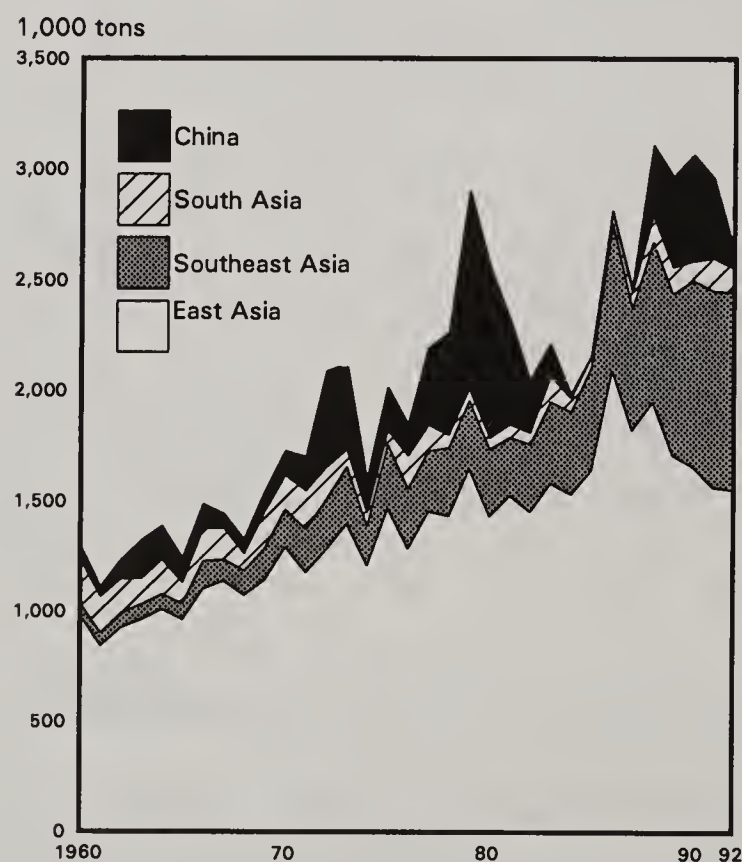
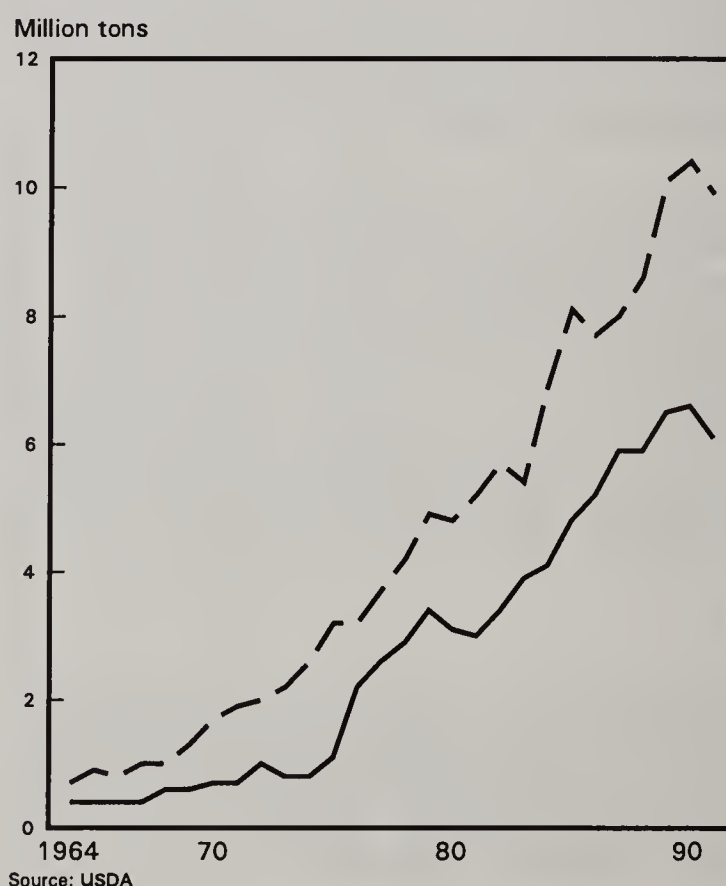


Figure A-11

Asian Edible Oil Imports and Exports



same time, Pakistan and India, highly competitive producers of both raw cotton and textile products, rapidly expanded their exports of textiles and yarns to East Asian and other markets.

The trends in Asian fiber and textile trade in the 1980's were accompanied by an abrupt decline in the U.S. market share in the region. The trends are indicative of changes in comparative advantage as rising labor costs contract East Asia's textile

sector and shift imports away from raw cotton and towards yarns and cloth produced more cheaply elsewhere, including South Asia and China. If these shifts continue, opportunities for U.S. raw cotton sales may shift towards the smaller South-east Asian markets (figure A-10).

Table A-12. Asian trade in vegetable oils by subregion

	Imports				Growth rates			U.S. exports			
	1962-64	1969-71	1979-81	1988-90	1960's	1970's	1980's	1962-64	1969-71	1979-81	1988-90
	-----\$ million-----				-----Percent-----			-----\$ million-----			
Asia	107	172	2,077	2,788	7.0	42.7	4.3	15	75	359	307
Japan	10	15	212	240	5.9	30.4	1.4	1	1	33	44
NIC's	27	61	488	659	12.4	23.1	3.4	2	3	7	20
Mid-income SE Asia	7	10	80	225	6.2	23.1	12.2	--	--	5	5
Low-income SE Asia	18	9	24	27	-10.3	10.6	1.7	--	4	2	0
South Asia	40	69	1,119	933	8.2	32.1	-2.0	13	67	275	238
China	5	8	155	703	7.0	33.7	18.3	0	0	38	--
World	1,032	1,642	8,656	10,953	6.9	18.1	2.6	146	253	745	479

Sources: Import data: Food and Agricultural Organization of the United Nations; export data: U.S. Bureau of the Census

-- = less than \$500,000

U.S. Role in Edible Oil Trade Falls

Asian edible oil imports grew moderately in the 1980's, after rapid expansion in the 1970's (table A-12 and figure A-11). Beginning in the mid-1970's, growth in Asian edible oil imports was driven by rising incomes and limited production capacity in the NIC's and South Asia. During the 1980's, reduced growth in imports stemmed largely from import substitution policies that sharply reduced India's imports, a decline only partly offset by rapid growth in imports by Pakistan and, particularly, China, which is now the region's largest importer.

The U.S. share of Asian edible oil imports has declined sharply since the early 1970's. U.S. sales were particularly hard hit during the 1980's, when the U.S. share fell from 35 percent to 20 percent. The decline in U.S. exports and market share was due initially to competition from South American soybean oil, but Malaysian and Indonesian palm oil provided much of the competition during the 1980's. Palm oil has proven to be highly price-competitive in the region's markets and, especially in South Asia, has found more consumer acceptance than soybean oil. With the rapid expansion of Malaysian and Indonesian palm oil supplies, Asia remains a net exporter of edible oils despite strong growth in import demand in some countries.

Factors Affecting Trade in the 1990's

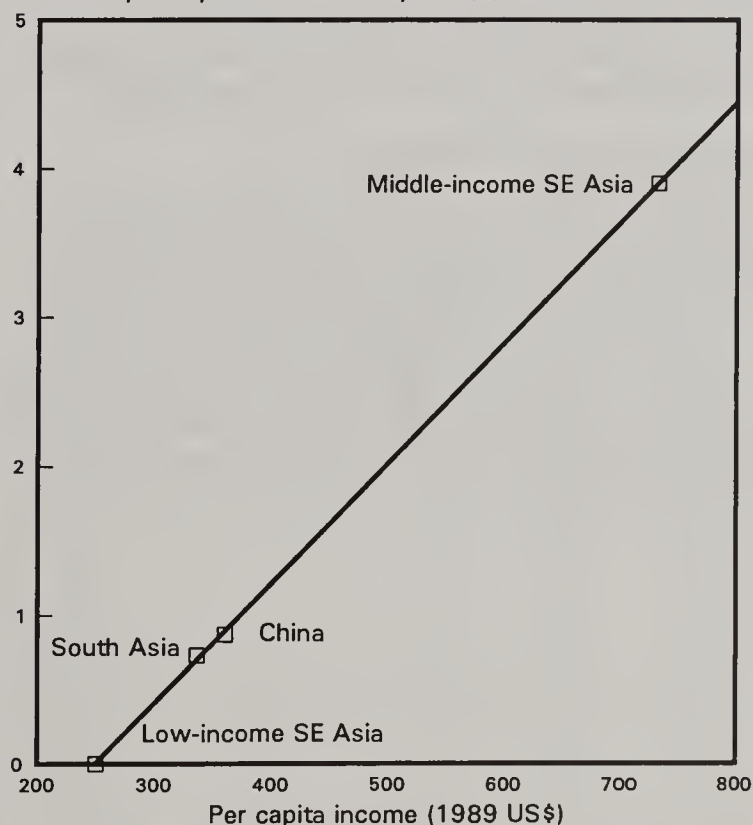
Asia's agricultural trade patterns during the 1990's will likely be determined by several fundamental factors. Foremost among these are regional economic growth and changes in agricultural and trade policies. Future developments in agricultural technology, and in the capacity to invest in new technology and infrastructure, will probably also be key.

Figure A-12

Selected Asian Countries:

Per capita U.S. Farm Exports vs. Income

1988-90 per capita U.S. farm exports (\$)



Source: World Bank

Income and Population Growth

Growth in Asian agricultural imports, and in U.S. farm exports to Asia, have been highly correlated with growth in per capita incomes (figure A-12). Rising incomes have boosted consumer demand for food at a faster pace than in other regions,

and have generally been correlated with increased capacity to import food. Equally important, rising incomes have generated demand for higher value products, such as meats and processed foods. Increased meat consumption and rising demand for feeds have enhanced the region's agricultural trade, including imports from the United States. Finally, rising incomes have shifted the comparative advantage of Asia's higher income countries away from farming—a further stimulus to agricultural trade.

Future import demand in Asia will be highly sensitive to the overall rate of economic growth, and the pattern of growth across the high- and low-income countries. Although Asia's higher-income countries now account for the bulk of farm imports, import growth will slow because of the high levels of income and food consumption already achieved. Increasingly, the rapidly expanding low- and middle-income countries are likely to generate most of the growth in demand for food and feeds. The extent to which this growth is translated into import demand will depend on the capacity of these countries to expand production and purchase imports.

Population growth will also continue to be a major factor driving expansion in Asia's aggregate demand for food. The population issue has been important for decades, although concerns abated following the rapid increase of food grain output associated with the Green Revolution. However, with more than half of the world's inhabitants, population growth will continue to have a major impact on Asian food requirements. In addition, larger populations and incomes will create an increasingly urban society in Asia, a trend that has generally increased demand for convenient and processed foods.

Agricultural and Trade Policy

The dynamics of domestic agricultural and trade policies will also significantly influence agricultural import patterns. The region's higher income countries typically provide substantial protection to agricultural producers, at a high cost to consumers. These policy regimes are facing internal pressures for change from environmental and consumer interests, as well as from multilateral and bilateral sources. Middle- and low-income Asian countries, on the other hand, tend to provide little or negative net support to producers, while subsidizing

consumers. Pressure for policy change in these countries stems largely from concern with stimulating adequate investment and growth in generally competitive farm sectors, and with the cost of consumer subsidies.

Unless a multilateral agreement on agricultural policy reform imposes more radical changes, policies in Asian countries will likely evolve slowly in the direction of internal pressures for change. This may imply gradual changes to reduce protection and expand imports by higher-income countries. On the other hand, policy changes in lower-income countries could slow growth in imports by reducing taxes on production and subsidies on consumption. The implications of a multilateral treaty to reform agricultural policy are difficult to assess without knowing the details of the agreement. However, it is probable that such an agreement would speed up the opening of protected markets in higher-income Asian countries, while having little direct impact on policies in countries where protection is low or negative.

Technology and Investment

As in other regions, technological change and the ability to overcome constraints on agricultural output imposed by limited land availability will likely influence Asia's future trade patterns. Maintaining adequate growth in productivity will be particularly important in the low- and middle-income countries, where yields remain relatively low. There, productivity gains will depend on investment in basic biological research, investment in irrigation and other basic infrastructure, and implementation of appropriate policies. Because of fiscal and balance-of-payments pressures, it is not clear whether some of Asia's low income countries can sustain adequate agricultural investment.

For the region's higher-income countries, where productivity is already high, the key technological factor may be the growing environmental costs of intensive production practices. It is already clear that traditional policies for increasing output by raising output prices and input intensity can have high, and possibly unacceptable, environmental costs. As these costs mount, there may be increasing constraints on intensive crop and livestock production practices that, in turn, impact on trade.

BOX 1

Economic Growth in Asia

Economic growth in most Asian countries has exceeded the world average in the last two decades. Relatively strong income growth is a key factor driving gains in the region's share of global farm imports and U.S. farm exports. In the 1990's, growth in Asian farm trade will again hinge on the region's economic performance.

The commodity demand projections contained in this report are based on forecasts of real economic growth summarized the table and figure below. These forecasts are consistent with the following assumptions regarding trends in the global economy:

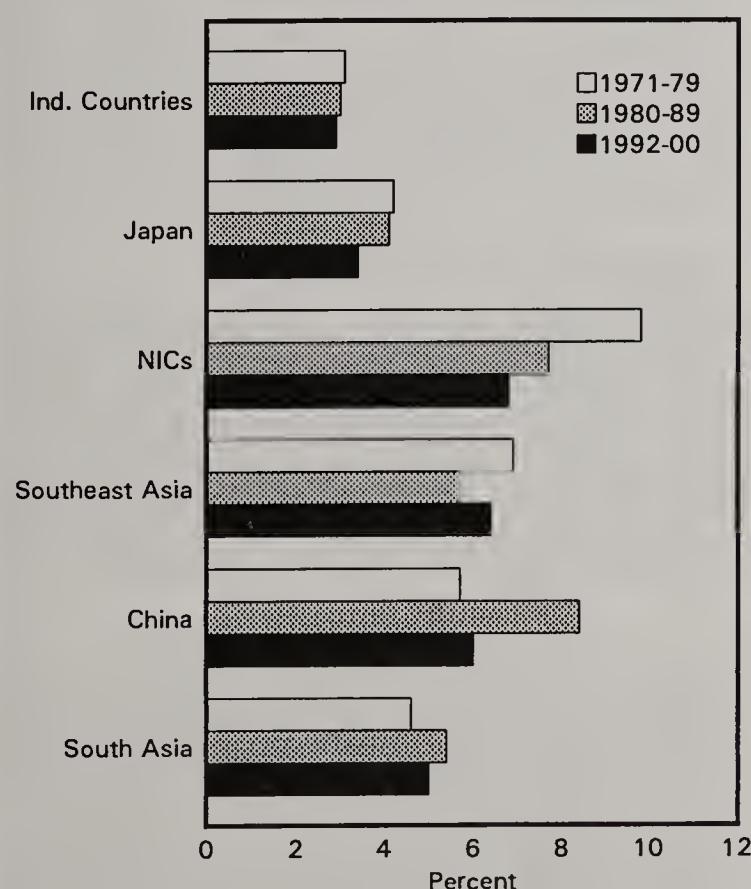
- Continued slower world growth through the mid-1990's, with only a moderate recovery in the United States and other industrialized economies now in recession. Growth in Germany and Japan is expected to slow; the former constrained by high costs of unification, and the latter by lower consumption and investment associated with the declining asset values.
- More robust global growth by the mid-1990's associated with improved performance in Canada, Western Europe, and Japan. However, growth is expected to remain below levels achieved in the 1980's. Japan's economy

will continue to be affected by higher costs of borrowing and slower growth of net wealth. Movement towards the goals of the Maastricht agreement will require fiscal restraint throughout the EC, holding growth below 3 percent.

Consistent with this global outlook, growth in many Asian economies is projected to slow in the 1990's compared with the 1980's—although remaining strong relative to the rest of the world. In the more trade-dependent countries of East Asia, growth is expected to be slowed by continued weak demand in developed countries. For the less trade-dependent economies, primarily China and South Asia, the capacity to sustain growth rates achieved in the 1980's is threatened by emerging fiscal constraints and the uncertain outcome of current economic reform efforts. In contrast, higher growth in Southeast Asia is indicative of the improved environment for growth and trade established by policy adjustments in those countries.

Although these forecasts represent expected future growth, they also constitute a major area of uncertainty in projecting commodity trade. The mix of appropriate policies and resource endowments in Asia, combined with declining dependence on trade with North America and Europe (see Box 11), could lead to stronger growth in the 1990's. On the other hand, slowed trade to other regions, combined with weaknesses in infrastructure and investment, could slow Asian growth.

Asia: Annual Growth in Real GDP by Region



Selected Asian countries: Real GDP growth and per capita income

Country	Real GDP growth		Per capita	Proj.
	1970-79	1980-91	GDP 1989	real GDP growth 1992-00
	Percent		Dollars	Percent
Bangladesh	2.3	4.2	180	3.8
China	5.1	8.8	360	6.0
Hong Kong	8.8	6.5	10,320	5.6
India	3.3	5.3	350	5.0
Indonesia	7.0	5.4	490	6.0
Japan	4.2	4.1	23,730	3.4
Malaysia	7.6	5.5	2,130	6.8
Myanmar	4.1	4.4	400	3.0
Pakistan	4.6	6.1	370	6.2
Philippines	5.8	1.2	700	4.8
South Korea	9.2	9.2	4,400	7.3
Taiwan	9.1	7.9	7,512	6.4
Thailand	6.9	7.6	1,170	7.0
Vietnam	N/A	N/A	230	6.5
Total	4.5	4.9	--	4.4
Less Japan	5.6	6.9	--	6.3
United States	2.8	3.1	21,100	2.8
Ind. countries	3.1	3.0	--	2.9
E. Community	2.9	2.4	--	2.7

NA = Not available; -- = Not applicable.
Source: ERS 1992 fall baseline estimates.

Bangladesh

Anwarul Hoque, Mark Giordano, and Rip Landes

Abstract: Bangladesh is among Asia's poorest and most populous nations. Rice imports are projected to be relatively small, but imports of wheat are likely to expand.

Keywords: Bangladesh, agriculture, policy, trade, wheat, rice.

Introduction

Bangladesh, with a population of 114 million and an annual per capita income of \$180, is among the most populous and poorest countries in the world. The country is blessed with fertile land and water resources, but has limited physical infrastructure and—other than natural gas—virtually no mineral resources. Agriculture, which generates nearly half of GDP and exports and three-quarters of employment, is the dominant economic sector. However, the progress of agriculture is greatly impeded by the limited per capita availability of arable land and recurring natural disasters.

Bangladesh has made significant progress towards long-term economic and social goals. Since independence in 1971, great strides have been made towards the key policy goal of food grain self-sufficiency. Investments in the agricultural and water sectors have more than doubled rice output in two decades. And, although the economy remains heavily dependent on foreign aid and borrowing, market-oriented structural reforms have helped to improve efficiency and maintain economic growth.

Bangladesh has increasingly pursued an export-oriented economic policy. Partially as a result, annual import growth slowed from 15 percent in the 1970's to 4 percent in the 1980's, while growth in exports remained near 7 percent in both decades. In 1990, imports reached \$3.8 billion, with agricultural commodities such as wheat, rice, raw cotton, edible oils, and sugar accounting for 20 percent of the total. Merchandise exports were \$1.7 billion in 1990, with jute goods, tea, fish, shrimp, and other agricultural commodities accounting for 30 percent. U.S. farm exports to Bangladesh, consisting primarily of wheat, rice, raw cotton, and edible oils, averaged \$133 million during 1989-91. Most U.S. shipments occurred through concessional and commercial credit programs.

Economic Trends and Policies

Despite the burden of large fiscal and trade deficits—and repeated disruptions by natural disasters—real GDP grew 4.2 percent annually during 1980-91. Agriculture expanded only 2.7 percent annually during the 1980's, but growth was higher than in the 1970's. The manufacturing and service sectors grew more than 5 percent annually in the 1980's, thus increasing their roles in the economy and accommodating the movement of labor out of agriculture.

Economic policy has emphasized development-oriented public investment. However, national savings—more than half of which is worker remittances—has financed only about half of total investment. Similarly, export earnings covered only about half of the import bill, and public revenues paid for only about half of public expenditure. These large fiscal and trade deficits result in heavy dependence on foreign aid and borrowing, as well as substantial inflationary pressure. Recently, economic performance and the deficits worsened due to the effects of the Gulf crisis in 1990 and a severe cyclone in 1991.

To reduce the deficits, the government has introduced policies to stimulate domestic production by deregulating private investment, inviting foreign direct investment, denationalizing public sector enterprises, and improving agricultural incentives. Rapid development of domestic energy supplies, especially natural gas, has resulted in relatively high growth in the power and fertilizer sectors and enabled import substitution for petroleum products. Since the late 1980's, both deficits and inflation have been reduced through adjustments to monetary and fiscal policy achieved with the assistance of the International Monetary Fund and the World Bank. However, fiscal deficits remain large, leading to constraints on development expenditures that impede economic growth.

Trade Performance and Policies

Following independence in 1971, the Bangladesh economy was heavily dependent on imports for basic necessities, including food. By 1980, imports reached \$2.4 billion—more than triple export earnings—with food accounting for 30 percent of the total. Despite substantial foreign aid, reserves were at record lows. To strengthen the balance of payments, Bangladesh pursued policies that would promote nontraditional exports and reduce imports of consumer goods.

By the late 1980's, reserves improved—boosted by devaluation of the taka, better exchange rate management, support from the IMF, and increased worker remittances. Imports continued to grow, primarily because of increased purchases of capital goods, but imports of consumer goods and food have declined; food now accounts for about 15 percent. At the same time, gains in exports and worker remittances have reduced the current account deficit to the lowest since 1980. Export growth has been led by manufactured goods, particularly garments.

Agricultural Trends and Policies

Bangladesh agriculture is characterized by subsistence farming on small, fragmented, family farms. Cultivable land is a scarce resource amounting to about 0.1 hectare per person. About 8.6 million hectares, or 92 percent of arable area, are cultivated with an average of 1.6 crops each year. Average farm size is only 0.9 hectares and 95 percent of the farms have less than 3 hectares. The predominance of subsistence farming, with low marketable surplus, plays a significant role in agricultural and trade conditions.

Agriculture is dominated by food grain production, primarily rice. More than 85 percent of cropped area is planted with food grains, 94 percent of which is rice. Wheat area increased significantly over the last two decades, but accounts for less than 5 percent of cropped area. Oilseeds and pulses cover another 5 percent of area, and jute and tea—the major cash crops—occupy about 4 percent of area.

During 1980-91, farm output grew at 2.7 percent annually, with stronger growth in later years. Food grains, primarily rice, accounted for most of the growth as land was shifted from jute and other crops to production of rice and wheat. Food grain production grew at an annual rate of 3.4 percent between 1980 and 1991, but output growth in other crops and in the livestock sector was relatively weak.

Policy Developments

Agricultural policy continues to promote self-sufficiency in food grains, as well as diversification into the production of crops with export potential. With cultivable area constrained, emphasis is on boosting productivity by increasing the availability of variable and fixed inputs, and on creating institutions to efficiently and equitably distribute these inputs. Investment is focused on improving the availability and use of high yielding variety seeds, fertilizers, pesticides, irrigation and drainage systems, flood control, and roads.

The public sector has played a major role in all aspects of agricultural development, including input supply, infrastructure investment, and price supports for marketed outputs. Supply of improved seeds, chemical fertilizers, irrigation equipment, plant protection materials, and credit has been facilitated through public agencies, often with significant subsidies. Since the late 1980's, the government has gradually reduced subsidies, particularly on fertilizers, and privatized input distribution. However, the public sector continues to control the production and import of fertilizer and irrigation equipment.

The government provides price supports for rice and wheat by offering to purchase output at a fixed price. In addition to providing price support and stabilization, domestic procurement augments supplies of imported wheat and rice to meet the requirements of a wide range of subsidized food distribution programs. In general, support prices for rice have been near import parity, and wheat prices below import parity. Despite these interventions, most of the domestic market surplus is handled by private traders.

Until 1992 the government held a monopoly on food grain imports. In 1992, in a bid to further privatize the food sector, private wheat imports were permitted and exempted from a 30 percent duty. It is too early to assess the impact of wheat trade privatization, but it is likely that at least some imports will be conducted by private traders.

Rice Import Needs Decline

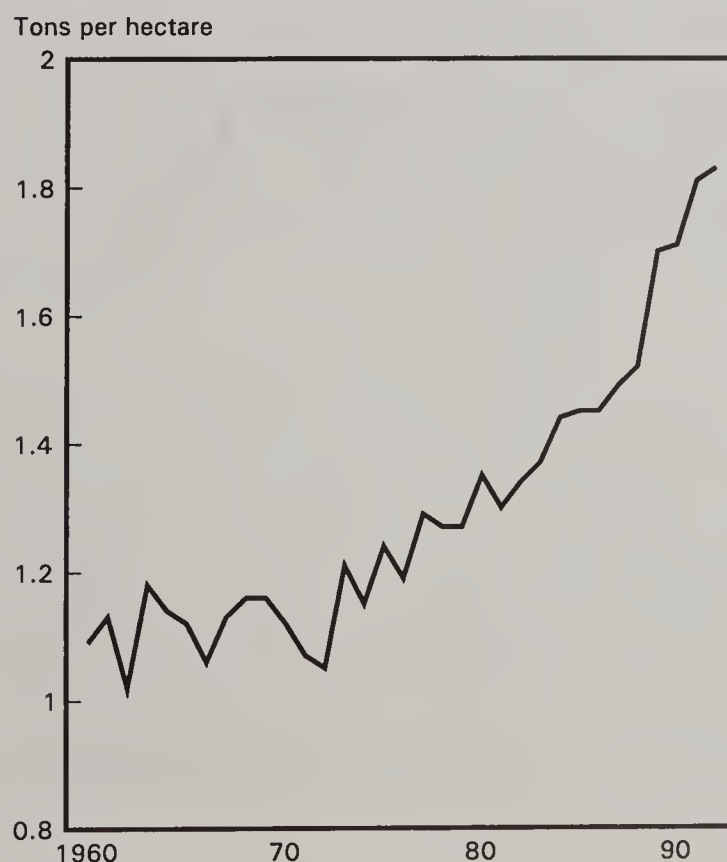
Rice is the major crop and food staple in Bangladesh. Because of gains in production, Bangladesh has reduced its rice deficit and now makes only small commercial purchases of rice—except in years of flood or drought. Bangladesh occasionally imports rice from the United States, but the bulk of imports come from Thailand and Pakistan.

The high-yielding rice technology package of seed, fertilizer, and irrigation was introduced in the 1960's, leading to significant production gains beginning in the early 1970's. Despite virtually no scope to expand cropped area, rice area increased due to shifts in land use from other crops and higher cropping intensity. Yield gains were driven by expanded cultivation of high-yielding varieties on irrigated land. Between 1980 and 1990, irrigated rice area increased from 1.5 million hectares to 3.1 million, and high-yielding rice area doubled from 2 million hectares to 4 million. These factors helped rice yields grow at an average rate of 2.8 percent during 1980-91, compared with 2.3 percent during 1972-80 (figure B-1).

Per capita consumption of both rice and wheat varies with fluctuations in domestic production, imports, and consumer

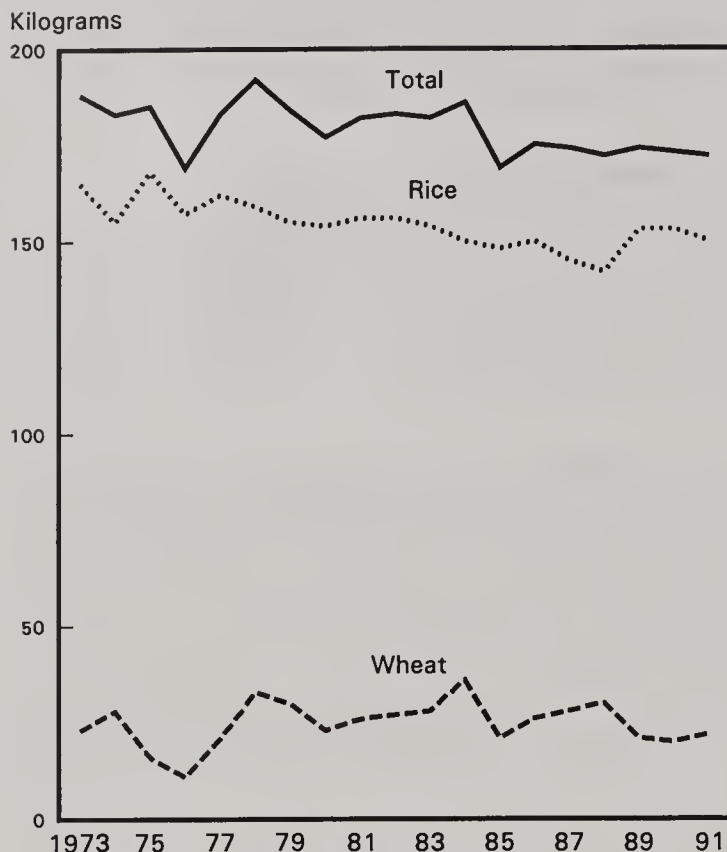
Figure B-1

Bangladesh: Rice Yields



Source: USDA

Figure B-2

Bangladesh: Per-Capita Food Grain Consumption

Source: USDA and U.S. Bureau of the Census

incomes (figure B-2). Imports and changes in stocks typically only partially offset periodic production losses. During the 1980's, despite gains in production, per capita consumption of both rice and wheat declined. Slowed growth in per capita consumption was associated with less growth in the subsidized distribution of imported grain, hikes in consumer prices in the early 1980's, and continued rapid population growth (figure B-3).

Wheat Output Stalls

With the introduction of high-yield technology, wheat production expanded rapidly in the 1970's and early 1980's, rising from 60,000 tons in 1970 to a peak of 1.48 million tons in 1985. The optimism for further gains was, however, short-lived because declining yields eventually induced farmers to shift land from wheat to other crops. By 1990, wheat production fell to 890,000 tons.

Though wheat is not a staple food in Bangladesh, it dominates cereal imports because of its low cost relative to rice and acceptance by consumers as a rice substitute in government food distribution. In recent years, the country's food deficit has generally been met by wheat imports averaging 1.6 million tons—about half from the United States. Most wheat is imported through concessional programs, but increasing amounts are imported commercially, including imports of U.S. wheat through the Export Enhancement Program (EEP).

Despite the recent removal of wheat import restrictions for private traders, there are still many constraints to significant private imports. These include the need to secure financing and arrange for port and storage facilities, as well as competition from the relatively low administered prices for domestic and imported wheat sold through government distribution programs. Nevertheless, at least some wheat imports are expected to be conducted by the private sector in the 1990's.

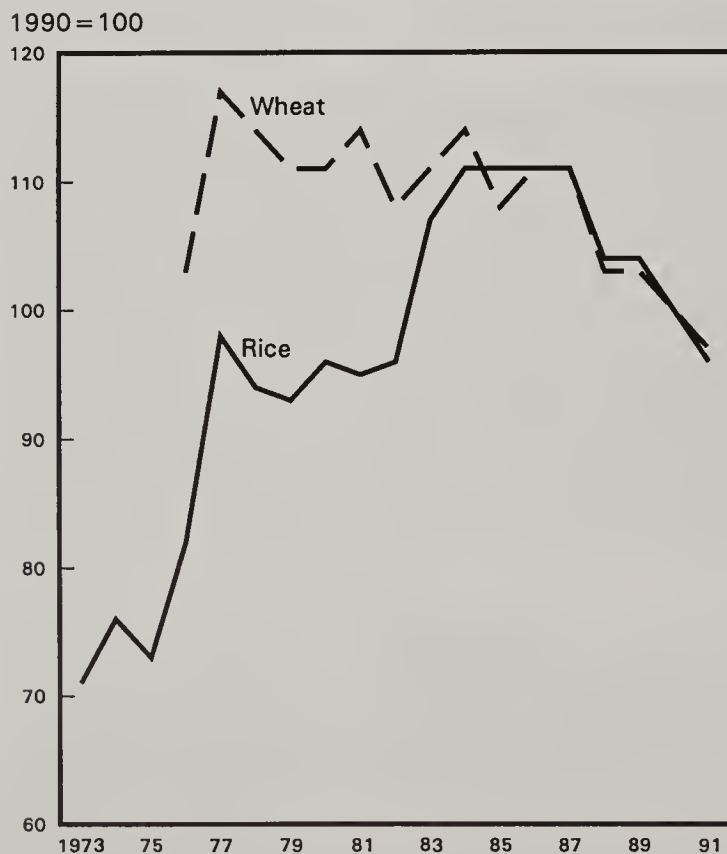
Issues Affecting Food Grain Trade in the 1990's

During the 1990's, the policies of the Government of Bangladesh and donors likely will continue to be aimed at poverty alleviation and provision of the basic needs of the growing population. Policy makers face a daunting task in attempting to raise incomes in the presence of severe constraints on natural and financial resources, and the recurring devastation from natural calamities. Food grain trade prospects may be most affected by the degree of success achieved in boosting incomes, by changes in agricultural policy, and by progress in developing irrigation potential.

Income and Population Growth

During 1990's, the government is targeting annual real GDP growth of 5.5 percent, compared with the actual 4.2 percent during 1980-91. Achievement of such strong overall growth would require an improvement of the 2.7 percent annual growth in farm output generated in the 1980's, combined with higher growth in manufacturing output. Improved performance would, in turn, require a sharp gains in investment

Figure B-3

Bangladesh: Trends in Food Grain Ration Prices

Source: Government of Bangladesh

through some combination of higher domestic savings, worker remittances and, particularly, foreign borrowing and aid.

While economic performance could reach government targets through a highly successful program of economic reform and promotion of exports and foreign investment, past performance suggests slower growth is more likely. For the purposes of the base projections provided below, real GDP growth is assumed to average 3.8 percent during 1992-2000, down marginally from the rate achieved in the 1980's. Key factors are the expectation that the government will not be able to reduce the trade or fiscal deficits as quickly as planned. Growth in exports, direct investment, foreign aid, and worker remittances are assumed to be slower than planned—at least through the mid-1990's—because of a sluggish global economy.

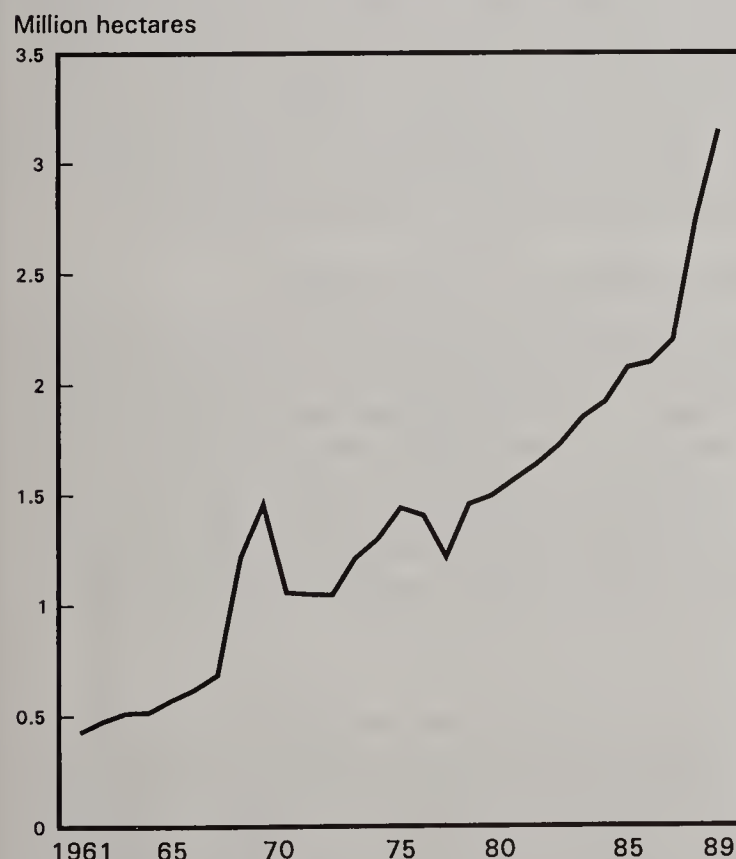
Population growth is projected to slow from 2.6 percent during 1980-91 to an average of 2.3 percent during the 1990's. Despite the projected slowdown, the population growth rate will remain among the highest in Asia and significantly reduce growth in per capita incomes.

Agricultural Policy Reform

Self-sufficiency in food production, crop diversification, and enhanced export crop production are likely to remain the basic principles of agricultural policy in Bangladesh in the 1990's. However, some agricultural policy changes could affect food grain supply, demand, and trade in the 1990's.

Figure B-4

Bangladesh: Trends in Irrigated Area



Source: Government of Bangladesh

Subsidies on agricultural inputs such as chemical fertilizer and irrigation equipment are likely to be further reduced or eliminated, with imports and domestic distribution of inputs liberalized and privatized. The short run impacts of these shifts may be to raise costs and slow yield growth. However, longer term impacts are expected to be negligible, particularly if output price policy is supportive and resources are shifted to infrastructure investment.

Imports of food grains, primarily wheat, by private traders will likely increase gradually. Because domestic wheat prices are generally below import parity, significant gains in private imports will require government action to either raise domestic consumer prices, or to increase budget subsidies to consumers. Hikes in consumer prices can probably only be achieved slowly, and higher consumer subsidies are probably not workable in the current environment of IMF-sponsored reforms. Therefore, both domestic prices and private imports are expected to rise slowly.

Infrastructure Investment

As government intervention in input and output markets is reduced, an increasing share of government resources is expected to be directed towards investment in irrigation, drainage, and flood control. Growth in irrigated area has been a key factor behind gains in cropping intensity and—especially in combination with increased use of high-yielding varieties—gains in crop yields. Improved drainage and flood control will complement price policy and irrigation investment by reducing the risk of crop loss from floods. Given the constraints to imposing major price shocks on food staples, as well as inherently weak supply response to higher prices in subsistence agriculture, such investments are a favored option for boosting farm output.

The potential for ground and surface water irrigation in Bangladesh is estimated at 6.1 million hectares, of which only 2.3 million hectares are currently developed. Gains in irrigated area have averaged about 165,000 hectares per year in the 1980's, with particularly rapid development in the late 1980's (see figure B-4). For the base projections described below, irrigated area is assumed to expand by 250,000 hectares annually, faster than the 1980's average, but slower than during the late 1980's.

Food Grain Trade Prospects in 2000

Food grain self-sufficiency, which averaged 93 percent during 1989-91, is projected to slip to about 90 percent by 2000 under the base assumptions. Production growth is projected to slow from 2.8 percent annually in the 1980's to 1.8 percent in the 1990's, while the growth rate of consumption falls from 2.6 percent to 2.1 percent. The decline in output growth is driven by limited prospects for sustaining high growth in rice yields or for boosting wheat area. Although rice imports are projected to remain minimal—under the assumption that cheaper wheat continues to dominate imports—wheat imports are expected to rise faster in the 1990's.

Table B-1. Bangladesh: Base projections for food grains

	Growth rates				
	1979-1981 avg.	1989-1991 avg.	2000	----- 1980-90	1992-00
	-----Thousand tons-----			---Percent---	
Wheat					
Area (Ths. ha)	519	597	604	1.4	.1
Yield (Kg/ha)	1.86	1.67	1.98	-1.1	1.7
Production	965	997	1196	.3	1.8
Imports	1386	1429	2506	.3	5.8
Consumption	2295	2454	3674	.7	4.1
Per cap.(Kg)	26.1	20.7	24.8	-2.3	1.8
Rice					
Area (Ths. ha)	10277	10374	10489	.1	.1
Yield (Kg/ha)	1.31	1.74	2.05	2.9	1.7
Production	13432	18046	21516	3.0	1.8
Imports	295	133	128	-7.7	-.4
Consumption	13648	18040	21635	2.8	1.8
Per cap.(Kg)	154.9	152.3	146.0	-.2	-.4

Table B-2. Bangladesh: Results of high income scenario

	Base scenario	High income	Change
	----Thousand tons----		Percent
Food grains			
Production	22712	22712	.0
Net imports	2634	3084	17.1
Consumption	25309	25757	1.8
Per cap.(Kg)	170.8	173.8	1.8

Rice

The base projections call for rice production to grow 1.8 percent a year during 1992-2000, compared with 3.0 percent during the 1980's (table B-1). Growth in rice area is projected to remain at 0.1 percent per year during the 1980's. With most suitable land already planted to rice, increases in irrigated area will primarily affect yields. Projected gains in rice area are from greater cropping intensity associated with improved irrigation and drainage infrastructure.

Most of the production gain is expected to come from improved yields, attributable to better management, increased use of high-yielding cultivars, and more irrigation. High yielding varieties now cover only about 4.1 million hectares, or 41 percent, of food grain area. The average rice yield, currently 1.74 tons per hectare, is projected to rise to 2.05 tons per hectare by 2000.

Annual growth in rice demand is also projected at 1.8 percent during the 1990's. Slower demand growth compared with the 1980's stems from the assumption of slower income growth and the expected effects of a gradual increase in real consumer prices as subsidies are reduced. Consistent with consumer behavior in other low-income Asian countries, the responsiveness of rice demand to changes in income and price is estimated to be small. Per capita rice consumption is projected to continue to fall slowly, reaching about 146 kilograms in 2000.

The rice supply and demand projections imply a further decline in rice imports during the 1990's. This outcome is, however, contingent on the assumption that the government will continue to give preference to imports of lower-priced wheat to meet both chronic and acute food grain import requirements. Additionally, periodic setbacks in rice output stemming from poor weather and flooding are likely to continue to require occasionally significant rice imports through the 1990's.

Wheat

Wheat production is projected to increase only marginally from current levels. Wheat area is expected remain roughly constant due to the lack of additional suitable land. With continued adoption of improved varieties, crop management, and input use, average wheat yields are projected to rise from 1.7 tons per hectare currently to about 2.0 tons per hectare in 2000.

Wheat consumption is expected to rise relatively rapidly from present low levels. The effects of income growth are likely to be only partially offset by reduced price subsidies, as relatively low-priced wheat continues to dominate imports and public food grain distribution. Per capita wheat consumption is projected to rise from 21 kilograms in 1989-91 to a projected 25 kilograms in 2000—partially offsetting the decline in per capita rice consumption. With slow growth in wheat production, rising demand boosts imports nearly 6 percent annually, reaching 2.5 million tons by 2000.

Impacts of Stronger Income Growth

The base scenario results are predicated on an assumed growth rate of real GDP that is significantly lower than the government's target. If economic reforms are more effective than anticipated, or if Bangladesh receives more support from donors and lenders than is anticipated, real income growth could exceed the 3.8 percent rate assumed in the base scenario. The trade impacts of a one percentage point increase in the growth rate of real income—assuming that higher growth does not affect food grain production—are summarized in table B-2.

Stronger income growth boosts total food grain consumption in 2000 about 2 percent, and imports about 17 percent, compared with the base scenario. While this result overstates the trade effects, because price impacts on domestic supply and demand are excluded, available information suggests that price responsiveness is likely to be small. The allocation of increased imports between wheat and rice would likely hinge

Table B-3. Bangladesh: Results of irrigation scenario

	Base scenario	Increased irrigation	Change
	----Thousand tons----		Percent
Grains			
Production	22712	23465	3.3
Net imports	2634	1881	-28.6
Consumption	25309	25309	.0
Per cap. (Kg)	170.8	170.8	.0

on relative price movements not incorporated in the analysis. Presumably, wheat would continue to account for the bulk of increased imports.

Impacts of Faster Growth in Irrigated Area

Perhaps the key variable on the supply side of the food grain projections is the assumed rate of expansion of irrigated area. While supportive price policies are also essential, gains in rice yields and production have, historically, been most highly correlated with the expansion of irrigated area. Table B-3 summarizes the projected impacts on food grain trade of a higher rate of increase in irrigated area than was assumed in the base scenario. In this alternate scenario, the annual increase in irrigated area during the 1990's is assumed to be 1.5 percent per year, compared with 0.95 percent in the base scenario.

Faster expansion of irrigated area boosts food grain production in 2000 about 3 percent above the base scenario, reducing food grain imports by an estimated 29 percent. The additional irrigation expands production primarily by facilitating the use of high-yielding seeds and improved management practices on a larger share of rice area. Again, although excluded in the analysis, price effects are likely to be small. The estimated decline in food grain imports would likely affect both rice and wheat, but may lead to a larger decline in imports of higher-priced rice.

Implications for U.S. Trade

Growth in Bangladesh's wheat imports is expected to be more rapid in the 1990's than in the 1980's. Imports of rice, on the other hand, are not expected to rise because of further gains in production, and because relatively low-priced wheat is likely to continue to dominate food grain imports. The outlook, however, is sensitive to the rates of economic growth and agricultural investment. Stronger economic growth could significantly boost import needs, while more investment in irrigation and drainage infrastructure could significantly reduce import needs.

The outlook for faster growth in wheat imports in the 1990's suggests strong potential for U.S. trade—wheat is the major U.S. farm export to Bangladesh. However, the U.S. share of Bangladesh's wheat imports is volatile—ranging between 30 and 50 percent since the mid-1980's—suggesting the need to maintain competitiveness in order to benefit from the growing market. The availability of concessional supplies is likely to remain a key factor in maintaining market share. The shift towards privatization of wheat imports is also likely to gradually sharpen competition for commercial sales on the basis of price and, perhaps, quality.

BOX 2

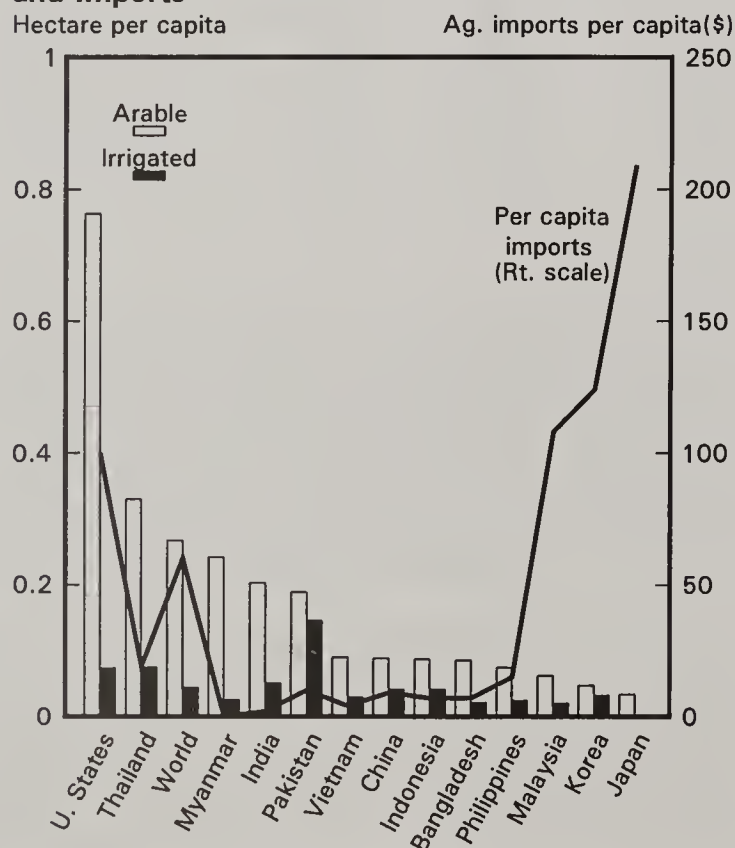
Population Growth in Asia

Asia contains more than half the world's population. Both the size and growth rate of the population are keys to Asian demand for agricultural imports. Population growth has slowed in most countries, particularly in higher income East Asia and China, pushing Asia's population growth rate below the world average. However, population growth remains above the world average in the lower income countries of South and Southeast Asia.

The country demand analyses in this report are based on population growth projections made by the U.S. Bureau of the Census. The projections, which factor in the effects of the changing demographic structure, indicate further declines in growth rates in both high and low income Asian countries in the 1990's. Even with population growth, future food demand and imports will continue to be affected by pressure on land resources and urbanization.

Arable Land Per Capita. A nation's deficit in agricultural commodities is related closely to the per capita availability of arable land, and the quality of land resources. Land constraints have been particularly important in determining import needs in a number of Asian countries where the supply of arable land is very limited. In other countries, however, pressure on land resources has, so far, been offset by such factors as weak effective demand or high land productivity, attributable to irrigation and a climate that often permits year-round cultivation.

Selected Asian Countries: Per Capita Farm Land and Imports



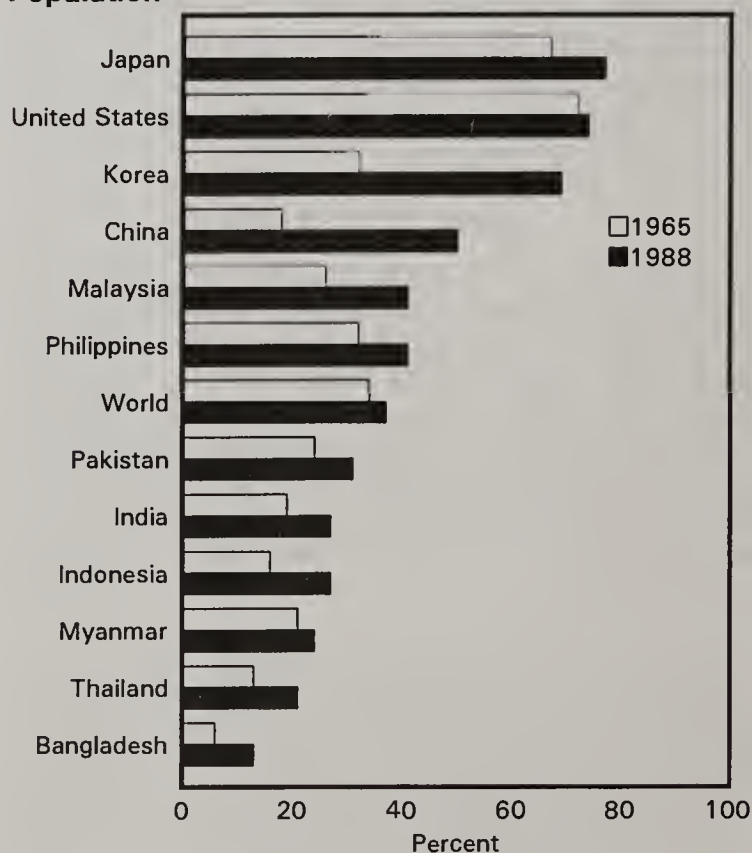
Urbanization. Population growth and rising incomes often increase the share of the population in urban areas, where consumers shift away from on-farm supplies and place more pressure on markets to supply food. The degree of urbanization varies widely across Asian countries. In general, however, most Asian countries are urbanizing at a fast pace, a trend that will continue to affect food demand in the 1990's.

Selected Asian countries: Population and population growth

Country	Population growth		Popula- tion 1991	Proj. pop. growth 1992-00
	1970-79	1980-91		
	Percent	Percent	Millions	Percent
Bangladesh	2.6	2.6	114.0	2.3
China	1.8	1.5	1,151.5	1.3
Hong Kong	2.4	1.3	5.9	.5
India	2.2	2.1	869.5	1.7
Indonesia	2.4	2.0	192.4	1.5
Japan	1.1	.6	124.0	.4
Malaysia	2.3	2.4	18.0	2.2
Mynamar	2.1	2.0	41.8	1.8
Pakistan	2.5	2.9	118.2	2.5
Philippines	2.7	2.3	65.8	1.8
South Korea	1.7	1.2	43.7	1.0
Taiwan	2.0	1.3	20.7	.9
Thailand	2.3	1.7	56.8	1.3
Vietnam	2.4	2.2	67.6	1.8
Total	1.9	1.7	2,889.9	1.4
United States	1.0	.9	252.5	.7
World	1.9	1.8	5,420.7	1.6

Source: ERS 1992 fall baseline estimates.

Selected Asian Countries: Percent Urban Population



China

Shwu-Eng H. Webb

Abstract: Rapid economic growth and policy reforms are expected to continue transforming China's agriculture in the 1990's, with potentially significant implications for Asian and U.S. agricultural trade. Rising demand is expected to make China a growing market for wheat and, in the longer term, a smaller competitor in corn, soybean, and cotton markets. Alternate assumptions on future developments suggest that China could become a net importer of feeds and cotton by 2000.

Keywords: China, agriculture, economic reforms, urban rationing, income elasticities, wheat, rice, corn, soybeans, cotton, meats.

Introduction

China is rapidly transforming from a centrally planned to a more market-oriented and internationally open economy. As of 1992, for example, 85 percent of the value of agricultural output was procured from open markets compared to 17 percent in 1978 (12). Recent large increases in urban grain and edible-oil prices suggest that the government is ready for additional marketing reforms that could further affect trade.

Economic reforms now under way stress economic efficiency, benefiting sectors where China has a comparative advantage—including labor-intensive enterprises such as textiles and other light industries. Market-oriented agricultural policies will shift some production away from traditional staples such as wheat and rice toward cash crops like vegetables and aquaculture. With China's population of 1.17 billion and a real per-capita income growth rate averaging 6 percent since the late 1970's, any changes affecting food consumption and production could have a major impact on global agricultural markets.

The short-term impact of economic reforms on farm trade may differ from long-term impact. In recent years, good harvests, combined with a decline in per-capita food grain use resulting from the removal of consumer subsidies, have led to a significant buildup in grain stocks. As a result, more corn and soybeans have been available for export over the last 2 years, while wheat and cotton imports have declined. However, the reforms should stimulate continued rapid growth in consumer demand for farm products, including wheat, livestock products, and feeds. Demand for some products is likely to outstrip supply, making China a growing market for U.S. agricultural products. In particular, economic reforms will likely increase imports or reduce exportable surpluses of wheat, feed grain, and oilseeds.

Economic Trends and Policies

Heavy industry was the top priority of the country's development policy from the 1950's through the 1970's. Policies called for low wages for government employees, including industrial workers in large cities. In return, the Government of China (GOC) provided cheap food, housing, utilities, and public services to urban residents. To meet urban commit-

ments and provide raw materials to State industries at low prices, the GOC tightly controlled the production and distribution of almost all commodities. Under the commune system, the State allocated national agricultural output and acreage targets to production teams. Most agricultural commodities were subject to compulsory quotas and commodity prices were set below world market levels. In essence, the government taxed the agricultural sector in order to support urban industrial development.

In 1979, the GOC sought to stimulate agricultural productivity by initiating economic reforms in rural areas. Most reform measures in the 1980's emphasized the liberalization of agricultural production. The adoption of the Household Production Responsibility System (HPRS) in the early 1980's passed the decision-making of agricultural production down to individual households. By 1984, more than 95 percent of agricultural production came from individual households. However, reforms related to the distribution and marketing of agricultural products were much more limited both in degree and in commodities included. Most important, the urban rationing system remained intact.

Recent policy changes, however, suggest that the government is attempting to accelerate reforms by removing consumer price subsidies, and to broaden them by including the marketing of staples. The GOC is pushing State enterprises to be more competitive with private enterprises and is making them responsible for their own profits and losses. Currently, State-owned enterprises still dominate the industrial sector. In 1991, non-state enterprises, mainly rural-based township and village enterprises, constituted only 34 percent of the industrial sector (2, 1992 issue, p.111).

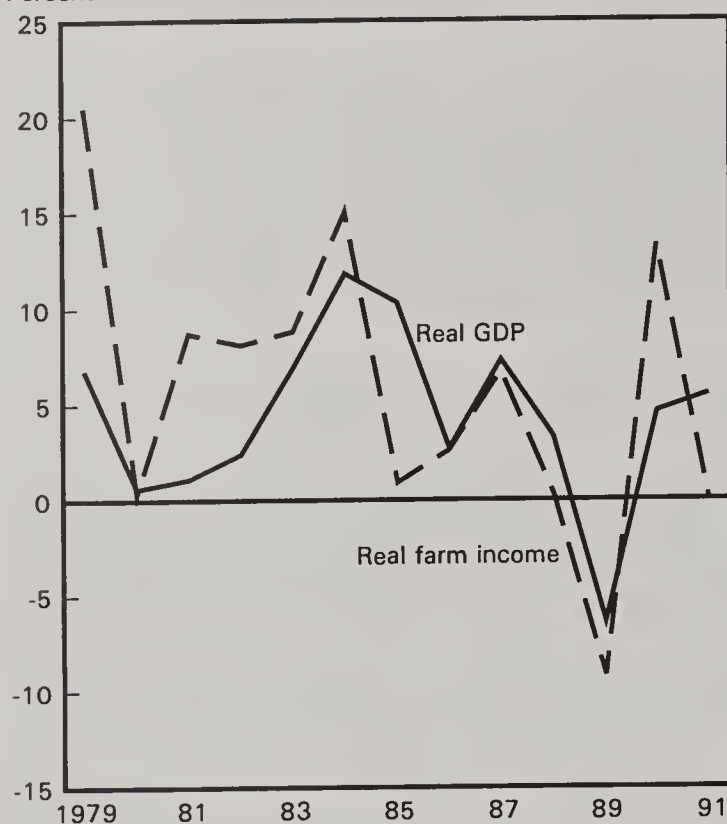
Economic Performance

Institutional changes introduced in the early 1980's have had a profound positive impact on economic growth in China. Real per capita Gross National Product (GNP) grew 6 percent annually between 1979 and 1991, four times that during the 26 years from 1952 to 1978 (2, 1992 issue, p.21). However even within the post-1979 period, economic policy and performance can be sub-divided into four periods.

Figure C-1

China: Growth of Real Per Capita GDP and Farm Income

Percent



The initial rural reforms, from 1979 to 1984, stimulated agricultural productivity by changing the incentive system by adopting the HPRS. Real income earned per agricultural worker grew 10 percent per year as compared to 2 percent for industrial workers. In 1978, earnings per agricultural worker were 15 percent of industrial worker earnings. By 1984, this ratio had improved to 25 percent. Increased agricultural productivity released surplus labor and capital, which contributed to rapid growth in rural industries, and real GNP grew at 9 percent per year (figure C-1).

The second period, from 1985 to late 1988, saw new policies aimed at liberalizing non-staples and non-essential raw materials. However, failure to broaden reforms in the production and marketing of staples became a major obstacle to sustained economic growth. This period, in general, was characterized by much slower agricultural growth. Real income earned per agricultural worker grew at an annual 3 percent, compared with 5 percent for industrial and 10 percent for service workers. Real GNP, however, still grew at a respectable 6 percent per year.

Mounting financial burdens led to a rapid expansion in money supply and a 25-percent inflation rate in the fall of 1988. The third period, from late 1988 to early 1991, was characterized by retrenchment. Concerned with stagnant grain production, the GOC placed tighter central control on its production. Also, economic reforms were generally placed on hold. For the first time in the 1980's, real GNP declined by 4 percent in 1989. Austerity measures quickly brought the inflation rate down from 19 and 18 percent in 1988 and 1989, respectively, to 2 and 3 percent in 1990 and 1991. Once inflation

was under control, austerity measures were removed, the economy recovered very quickly, and real per capita income grew at 7 percent in 1990 and 8 percent in 1991.

During the last period, from 1991 to the present, reform of the urban rationing system has been emphasized. The GOC raised the low government-fixed prices of grains and vegetable oils by more than 50 percent in May 1991 and then by 40 percent in April 1992. Urban grain prices had been held constant in the proceeding 25 years. To compensate for higher prices, the government now gives urban households 4.5 yuan per worker per month for grain and 1.5 yuan for edible oils (about \$1.25 or 5 percent of wages, 12), in essence converting grain and oil price subsidies into increased wages. The GOC also has established several wholesale markets for major farm commodities in preparation for further marketing reforms.

These and other policy reforms are likely to have a significant impact on the food economy. Some reforms may tend to dampen food demand. For example, recent first-time hikes in prices for urban housing and subsidized public utility services may reduce consumer food budgets. However, market-oriented reforms will likely sustain growth in consumer incomes and result in a price structure that is more consistent with consumer preferences. At the same time, sustained growth in the non-agricultural sector will bid resources, particularly labor, away from agriculture. Output growth from gains in agricultural productivity is not, however, likely to keep pace with the increase in food demand.

Trade Performance and Policies

Prior to 1979, China's foreign agricultural trade regime relied heavily on central planning. An annual trade plan for agricultural commodities was devised by the State Economic Planning Commission, then administered by the Ministry of Foreign Economic Relations and Trade. The State Planning Commission proposed grain trade levels. The quantity imported depended on urban ration requirements and commitments to domestic industrial uses that could not be met by domestic procurement. The availability of foreign exchange and world prices were important as well. Exports depended on product availability, world prices, and trading partners' agreements.

Since economic reforms were initiated in rural areas in 1979, China's government has relaxed some restrictions on its trade policies. Since the mid 1980's, local governments have been allowed to retain a portion of their foreign exchange earnings in order to import equipment and materials necessary for production or to sell their foreign exchange for domestic currency at higher-than-official rates. Most non-staple agricultural commodities and luxury consumer goods could be traded through provincial-level foreign trade organizations (FTO's). Trade of basic agricultural commodities remained tightly controlled by the government. Maintaining self-sufficiency of major agricultural products has remained a top priority despite rural economic reforms.

The GOC continues to limit market access, especially for agricultural products, and is still the sole agent for trade in food staples and essential raw materials such as cotton. To

control trade, meet domestic commitments, and support State enterprises, the government subsidizes export enterprises, controls foreign exchange allocations, and fixes the exchange rate.

The recent reform measures have promoted trade for China. Imports and exports have been growing at 11 and 13 percent per year, respectively, since 1979 (2, 1992 issue, p.23). The trade share of GNP increased from 9 percent in 1978 to 36 percent in 1991. Hong Kong, Japan, and the United States are China's most important suppliers and trading partners. According to GOC statistics, in 1991, Hong Kong imported \$17.5 billion (including re-exports), Japan \$10 billion, and the United States \$8 billion of China's goods and services. China's 1991 imports from Hong Kong, Japan, and U.S. were \$32.2, \$10.2 and \$6.2 billion, respectively.

China enjoyed a favorable overall trade balance in the early 1980's. Although more imports of technology and machinery associated with rapid economic development resulted in a trade deficit in 1985-1989, China has run a widening trade surplus since 1990.

U.S.-China bilateral trade has grown substantially in recent years. According to U.S. statistics, total U.S. imports from China increased from \$1 billion in 1980 to \$19 billion in 1991, while U.S. exports to China increased from \$3.8 billion in 1980 to \$6.3 billion in 1991.^{2/} U.S. agricultural exports to China fluctuated widely during the 1980's, ranging from \$2.3 billion in 1980 to \$57 million in 1986. Wheat accounted for about 80 percent of the value of agricultural exports to China in the 1980's. However, cotton exports increased to over \$250 million in 1991 and 1992. The share of wheat in U.S. agricultural exports to China decreased to about 55 percent while cotton increased to 40 percent in 1991-92.

Agricultural Trends and Policies

The importance of agriculture in China, as in most other developing countries, is declining. However, agriculture remains the most important sector in terms of employment. The agricultural labor force declined from 71 percent of total employment in 1978 to 60 percent in 1991 while agriculture's share of national income remained at 33 percent. A critical element for successful economic reforms in China is the transfer of surplus agricultural resources, particularly labor, into developing industrial sectors.

2/ There are differences in trade statistics between China's Custom Statistics and the U.S. Bureau of the Census. In 1991, China's Custom Statistics showed a trade balance of \$1.8 billion in favor of the United States, while U.S. Census statistics indicated a U.S.-China trade balance of \$12.7 billion in favor of China. China reportedly imported \$8.0 billion from the United States while U.S. sources reported only \$6.3 billion in U.S. sales. China's sales to the United States were only \$6.2 billion according to China's sources, compared with \$19 billion of U.S. imports from China reported by the U.S. Census Bureau. Sources of discrepancies (8) are: 1) Hong Kong often serves as a transshipment port for China's re-exports; 2) different methods of valuation; 3) time lags in currency conversion; 4) differences in the recording systems; and 5) recording errors from both countries. Reconciliation of these very large discrepancies is extremely difficult and there is no completely satisfactory explanation.

China, with 22 percent of the world's population, is also the world's largest producer and consumer of agricultural commodities. It accounts for about 25 percent of global grain production and 35 percent of pork production. Annual grain output averaged 402 million tons (including soybeans) during 1986-91 with consumption slightly higher. China has been a net grain importer every year since 1961, except 1985 and 1986. Maintaining grain self-sufficiency remains a policy priority in China and grain imports have been kept to a minimum. Even so, China's grain trade is important in world markets and its erratic buying behavior is often a major source of uncertainty for world trade.

China's grain production receives a high level of support from the GOC relative to most other crops in order to permit the government to meet urban distribution commitments. As a result, grain area remains high, accounting for more than 75 percent of sown area (down from 80 percent in 1978). Despite significant growth in rural enterprises, labor employed in the crop sector still accounts for about 70 percent of the total rural labor force in 1990 (2, p.279). The value of crops produced in 1990 was 58 percent of the gross value of agricultural output.

Producer Policies and Production

Most reform measures implemented in the 1980's emphasized shifting some decision-making to individual households. The adoption of the HPRS allowed farmers to sell their surpluses after meeting State quota obligations. Incentives to produce increased substantially. Per capita grain production increased from 317 kilograms in 1978 to 376 kilograms in 1991—or 1.3 percent annual growth. This growth was achieved despite an annual population growth rate of 1.5 percent, a 0.5 percent decline in grain area per year, and a decline in the labor force devoted to crop production. During the same period, per capita production of oilseed and meat products, earned higher relative returns than grain crops and increased at about 8 percent annually. Most of these productivity gains are attributed to the introduction of the HPRS in the early 1980's.

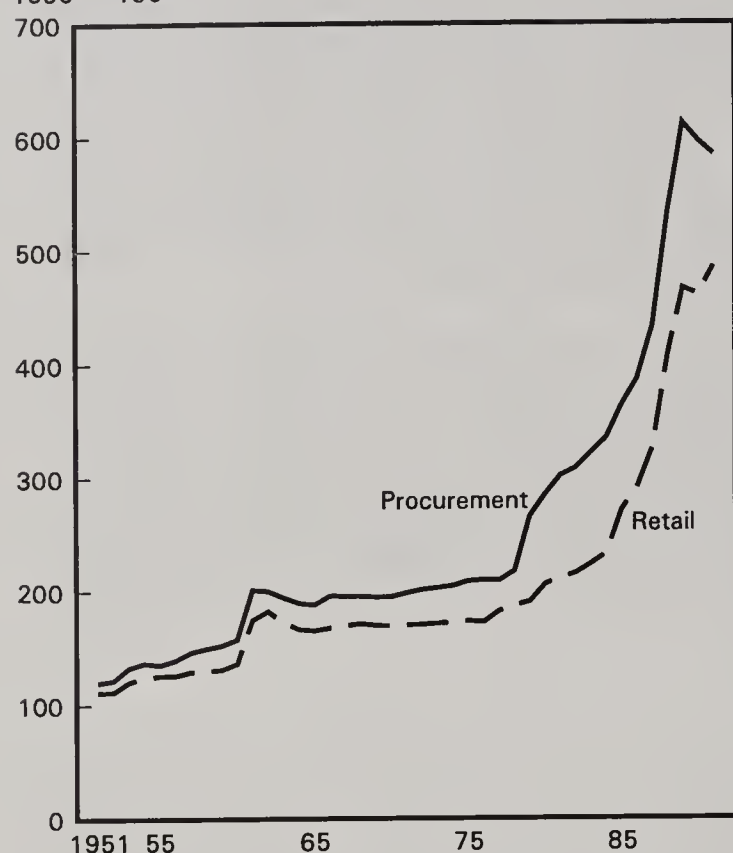
The GOC still regulates the production of many major agricultural products, including rice, wheat, corn, soybeans, sugar cane, sugar beets, cotton, tobacco, silk cocoons, and timber products. Production, procurement, and distribution of cotton, tobacco, silk, and timber products remain tightly controlled by the State. Since 1985, with the adoption of the double-track pricing system, commodities such as grains and oilseeds are procured and distributed at contracted and negotiated prices. Households negotiate contracts with economic cooperatives (production teams under the commune system) to farm parcels of land. The contracted household is required to provide a portion of a specified crop(s) to the cooperative as payment for use of the land and other inputs. This is called contract or quota procurement. The State can procure beyond the contracted amount only at the negotiated prices, termed "negotiated procurement."

To encourage grain and oilseed production, the GOC has continually increased the negotiated portion of procurement. Grain contract procurement declined from 91 percent of total government purchases in 1979 to about 50 percent in 1989

Figure C-2

China: Retail and Procurement Food Price Indices

1950 = 100



(14). For vegetable oils, the negotiated portion of State procurement increased by more than 17 times from 1978 to 1991, reaching 1.3 million tons or 41 percent of the State purchase. The State has also raised procurement prices of agricultural commodities a number of times since the 1979 economic reforms while the food prices for urban consumption have remained stable (figure C-2).

For non-staples including pork, vegetables and fruits, the majority of State purchases are now negotiated. The relative liberalization of meat markets and rapid economic growth have caused meat production and consumption to expand more rapidly than all other agricultural products. At the same time, heavy subsidies on urban consumption of State-distributed grain and edible oil have made it unprofitable for farmers to market grain and oil crops in cities.

Level of Government Intervention

Despite the rural reforms initiated in 1979, the GOC still intervened heavily in agriculture in the 1980's. In particular, border measures effectively insulated domestic markets from world markets. Both the aggregate level of intervention, and relative intervention across major agricultural commodities can be measured by producer subsidy equivalents.

Since 1979, the continuing increase in procurement prices of agricultural products, combined with a general decline in world agricultural prices, has changed the net effect of China's policies from taxing agricultural production to supporting grain and oilseed products. If it were not for the yuan's continuous devaluation, China would also show support for most of its major agricultural commodities in the 1980's, excluding peanuts and livestock products.

For grains, declining State procurement was associated with a slight upward trend in support during the 1980's, as shown by estimates of producer subsidy equivalents (PSE's; figure C-3). The distribution and production of oilseeds remained under tighter control than grain. Oilseed procurement still accounts for 65 to 75 percent of total production compared with 30 percent for grains. However, to maintain self-sufficiency in edible oils, domestic procurement prices of rapeseed and sesame—the main sources of edible oils—are maintained at high levels. Almost all cotton production is procured by the government and distributed to textile mills at relatively low fixed prices. Low support for cotton production reflects support for the development of the textile sector—the major export earner since reforms were initiated in 1979.

Relatively large negative support for production of pork and other livestock products stems primarily from low rural prices for livestock products due to limited transportation facilities. Despite low prices compared with world markets, livestock production has expanded rapidly because real prices of grains for feeding are also low in rural areas. Feeding of low-priced grains, especially rice, leads to low livestock production costs and market prices. Low feed costs are not accounted for in the PSE estimates shown in figure C-3.

Figure C-3

China: Producer Subsidy Equivalents by Major Commodity

Percent of producer value

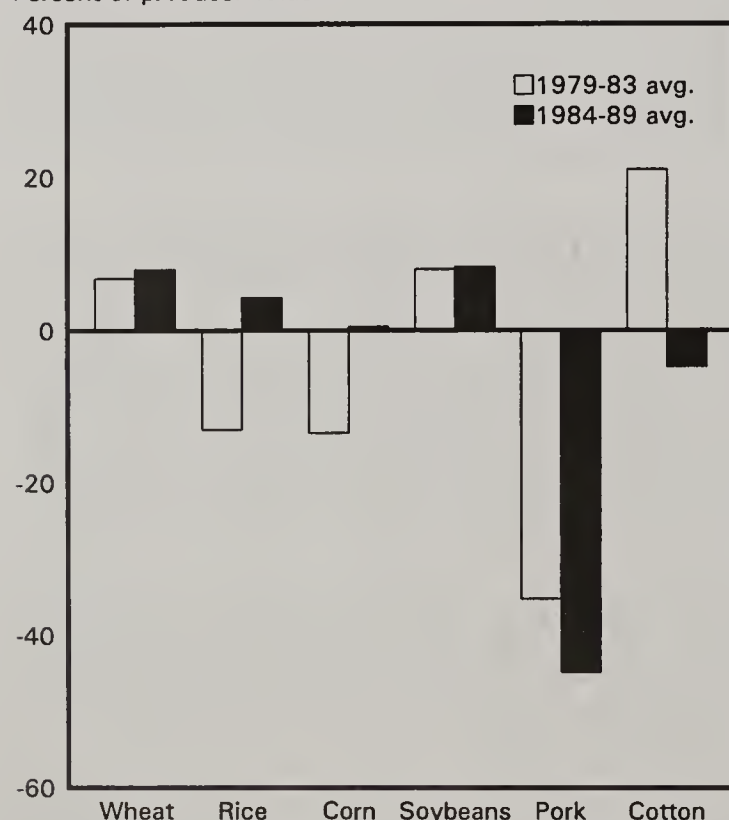
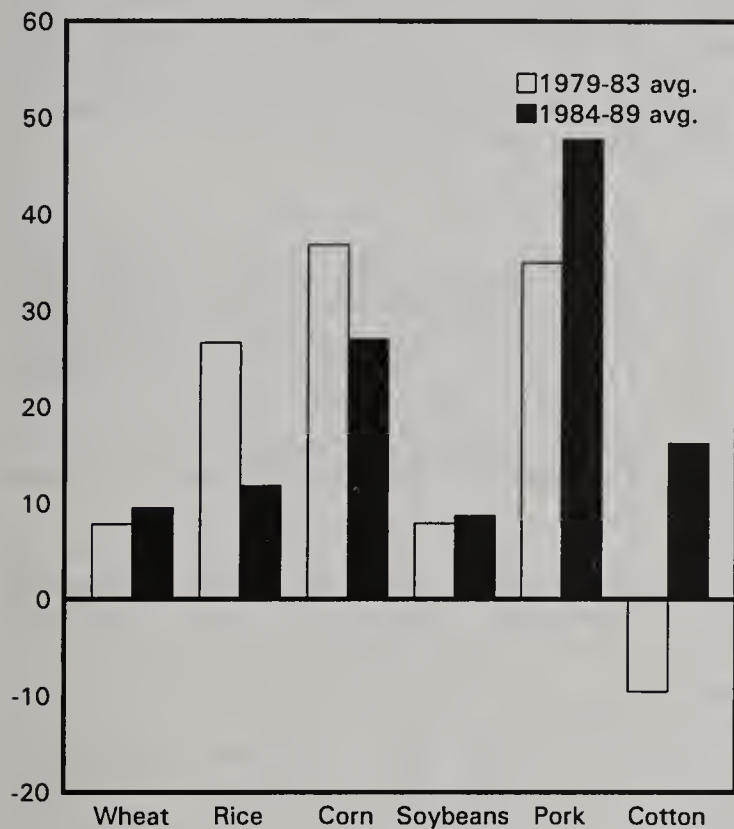


Figure C-4

China: Consumer Subsidy Equivalents by Major Commodity

Percent of consumer value



Consumer Policies and Food Demand

In 1985, the government announced the complete or partial removal of the urban rationing system for fruits, vegetables, livestock products, and some non-staple products. Livestock products, for instance, continue to be rationed but subsidies have been reduced. The prices for many of these commodities are now determined by market forces.

Until recently, there had been very little reform of the government's system of control over urban distribution of staple agricultural commodities. Under the double-track pricing system, the GOC distributed grain and vegetable oils to urban residents and specialized households at low, fixed prices. These prices were below both internal open market prices and farm procurement prices. Rural residents and coupon recipients who wished to purchase more than the rationed amount had to purchase from open markets. The State negotiates purchases on behalf of industrial users, reselling to them at the "negotiated" prices, instead of low, fixed prices.

Under the double-track system, the cost of consumer subsidies for grains and vegetable oils increased from 1.1 billion yuan (1 percent of total government expenditures) in 1978 to 26.7 billion yuan (7 percent) in 1991. The impact of these subsidies is reflected in estimates of consumer subsidy equivalents (CSE's; figure C-4). These estimates indicate significant transfers to consumers of grains and oilseed products.

With the recent removal of price subsidies, urban consumers will face higher negotiated prices for grains and oils, elimi-

nating part of the double shield that has subsidized urban consumption of these commodities. One part of the shield, consisting of border measures such as the existence of a sole agent for exporting and importing grains and vegetable-oils and a limited transportation infrastructure that constrains exports and forces down internal prices, remains intact. However, the second part of the shield—consisting of GOC sales to urban residents at low fixed prices—is at least partially removed.

Issues Affecting Agriculture in the 1990's

China's agricultural sector will continue to face numerous pressures for change in the 1990's. Economic growth, combined with the further reduction or removal of consumer price subsidies, will alter China's food consumption patterns. At the same time, the pattern of farm production may be affected by changes in support for producers of food staples. The extent to which these shifts affect China's agricultural trade will, in large part, depend on gains in productivity and the responsiveness of production to changes in incentives.

Income and Population Growth

China's economic development in the 1990's looks promising. For the purpose of the base projections, per capita real Gross Domestic Product is assumed to grow at an annual rate of 6 percent—only slightly below the rapid pace achieved during the 1980's. However, there are several uncertainties on the horizon that could hinder economic reforms. Particularly important is that China's political leadership is in transition. Inevitably, problems will arise with economic reforms and development. These may create pressure for China's reform-minded leaders to put economic reforms on hold, leading to slower economic growth.

Population growth, although slower than in other low-income Asian countries, will continue to generate significant demand for agricultural products. China's population grew at 1.5 percent per year over the last decade, and is projected to grow at an annual rate of 1.4 percent in the 1990's. Women now comprise 45 percent of China's civilian labor force (1, p.61). In 1990, 74 percent of the adult female population was economically active—compared with 50 percent for other Asian, newly industrialized countries. The large and growing number of two-wage-earner households is likely to increase the demand for convenience foods, including processed wheat products.

Changes in Food and Feed Demand

Relatively low real income growth between 1949 and 1979 and subsidized agricultural commodities for urban residents contributed to a fairly stable food consumption pattern in China. During the rapid economic growth of the 1980's, per capita grain consumption increased until 1986, when it began a gradual decline. However, per capita food grain consumption remains very high at 235 kilograms in 1991 (2, 1992 issue, p.279). Per capita meat consumption (excluding fish products) increased to 21 kilograms in 1991, more than double the 1978 level, but still below the world average of 25 kilograms. China's per capita meat consumption appears to have potential for growth as income levels increase. Richer Asian

nations with significant Chinese populations (Hong Kong, Taiwan, and Singapore), consume more than 60 kilograms per capita of meat annually.

Higher income elasticities for meat and feed grains imply that demand for these commodities will increase faster than for rice and wheat. Among the food grains, consumption of indica rice has started to decline rather sharply. Demand for better quality japonica rice, lean meat, better quality and different varieties of wheat flour, fruits, and vegetables appears to be rising.

Agricultural Producer Policy

Economic reforms will likely induce a more market-oriented agricultural production policy. However, maintaining grain self-sufficiency has always been a top priority, and China is likely to continue to pursue this goal in the 1990's. One reason is that small changes in China's supply and demand can have enormous implications for trade, and international markets may not be able to fill the gap at prices acceptable to China. Perhaps the key policy challenge facing China's leadership in the 1990's will be how, and to what extent, to reallocate production activities.

Consumer Policy and Urban Reform

During the last 2 years, the GOC has taken steps to reform the urban rationing system and eliminate direct price subsidies to urban consumers of grain and vegetable oils. The effects of these reforms on food consumption are difficult to assess. For the purpose of base projections, it is assumed that there will be few direct effects of removing urban consumer subsidies on grain and oil consumption.

The unit price subsidy on urban grain consumption has been high—the coupon prices of processed grain products are often less than two-thirds of the procurement prices of raw grains. However, the aggregate effects of price reforms on national prices will be small because urban rationed grains accounted for only about 15 percent (50 million tons) of total grain use in 1988. Two-thirds of grain output is consumed on-farm, with another 15 percent procured and sold at negotiated prices for industrial uses. As a result, the impact of removing price subsidies on grain consumption is likely to be small.

The most difficult aspect in forecasting China's agricultural trade, at least in the short-term, is estimating China's stock holding behavior. China's current grain stocks (both State and own-farm) are estimated by some sources to be at least one year of consumption. With the decline in per capita consumption and an improved marketing system, the need for individuals to maintain large grain stocks may decrease. The short-term impact on international trade depends on how China releases its stocks. The difficulty of projecting stock-holding behavior adds significant uncertainty to projecting China's agricultural trade in the 1990's.

Agricultural and Trade Prospects to 2000

The base projections indicate that China will be a small net exporter of rice and a growing net importer of wheat in the 1990's. The rapid growth in feed demand associated with maintaining self-sufficiency in meats is also expected to lead to a sharp decline in corn exports. Surpluses of cotton are also projected to diminish due to rising domestic and export demand for cotton-based textiles.

Rice

Rice, China's most important staple, now accounts for about 22 percent of sown area with production fluctuating between 127 and 140 million tons (milled) between 1986 and 1991. Prior to the 1979 economic reforms, rice was an important agricultural export but, with the gradual relaxation of centrally planned production and procurement, exports declined from more than 1 million tons in the early 1980's to 550,000 tons in 1991.^{3/}

Current per capita consumption of rice is over 120 kilograms (milled), accounting for more than 25 percent of protein intake. However, economic growth over the next decade is expected to reduce the role of rice in the diet—as was the case in Taiwan during its high per-capita income-growth period between 1965 and 1985. In addition, in China, the removal of price supports on rice consumption is likely to reduce the rice feeding to livestock. Overall, income and price effects are projected to more than offset population growth, leading to a decline in both per capita and total rice consumption by 2000 (table C-1).

While total rice use declines, higher incomes are projected to increase demand for better and different rice varieties—particularly japonica rice. Evidence of Chinese preference for japonica rice can be seen in the northern region where production has doubled to 17 million tons over the last decade while production and use of indica rice remains about the same. The consumption and production of japonica rice will continue to increase at the expense of indica rice. Rice area is projected to decline slightly. Within the remaining rice area, more and more will be converted to producing lower yield but higher-quality japonica varieties.

Wheat

Wheat is China's second largest crop, accounting for 20 percent of total sown area. Wheat also is China's most important agricultural import, accounting for more than 50 percent of the value of total farm imports. China's wheat sector is important in the global market, accounting for about 16 percent of world wheat output and between 6 and 14 percent of world wheat imports in the 1980's.

3/ In 1989, as China's grain supply stagnated, surplus rice provinces set up physical barriers to block sales to Guangdong province because they could not make a profit from grain transfers based on government fixed prices (8). The State allowed Guangdong to import a large amount of rice from foreign countries, mainly Thailand, resulting in net rice imports of 880,000 tons in 1989.

Table C-1. China: Base projections for crops

				Growth rates	
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1990-00
	avg.	avg.			
	-----Million tons-----			---Percent---	
Rice					
Area (Mil. ha)	33.68	32.79	32.61	-.3	-.1
Yield (Kg/ha)	3.17	4.22	4.12	2.9	-.2
Production	106.90	138.32	134.28	2.6	-.3
Net imports	-.59	.11	-.53	**	**
Consumption	107.49	138.34	135.51	2.6	-.2
Wheat					
Area (Mil. ha)	28.96	30.51	30.69	.5	.1
Yield (Kg/ha)	2.04	3.11	3.56	4.3	1.3
Production	59.19	95.00	109.25	4.8	1.4
Net imports	10.92	13.26	17.38	2.0	2.7
Consumption	70.11	108.26	126.13	4.4	1.5
Corn					
Area (Mil. ha)	19.97	21.11	21.46	.6	.2
Yield (Kg/ha)	3.04	4.33	4.96	3.6	1.4
Production	60.61	91.51	106.44	4.2	1.5
Net imports	1.23	-6.42	-2.76	**	-8.1
Consumption	63.02	81.02	103.68	2.5	2.5
Soybeans					
Area (Mil. ha)	7.50	7.56	8.15	.1	.8
Yield (Kg/ha)	1.10	1.36	1.58	2.2	1.5
Production	8.24	10.31	12.85	2.3	2.2
Net imports	.54	-.86	-.30	**	-10.0
Consumption	7.78	9.45	12.56	2.0	2.9
Soymeal					
Production	1.36	3.18	4.76	8.9	4.1
Net imports	-.18	-1.82	-.90	26.0	-6.8
Consumption	1.18	1.36	3.90	1.4	11.1
Cotton					
Area (Mil. ha)	4.87	5.78	6.48	1.7	1.1
Yield (Kg/ha)	.54	.81	.91	4.1	1.2
Production	2.62	4.66	5.89	5.9	2.4
Net imports	.72	.25	-.27	-10.0	**
Consumption	3.30	4.32	5.71	16.0	2.8

** = incalculable value

Population and income growth is projected to cause the demand for wheat to grow faster than supply, requiring larger imports. China will also likely become more quality conscious. There are signs that CERIOLS, the State trading agency, is making quality a more important determinant for

wheat purchases. Indeed, it has already allowed some concessions to joint-venture mills in Guangdong to permit imports of wheat with specific milling qualities.

Corn

Corn accounts for 15 percent of total sown area and is China's most important feed grain. In recent years, corn production has increased at a much faster rate than other grains in response to increased feed demand. Corn output reached an average of 91.5 million tons per year during 1988-91, or 18-20 percent of world production. In the 1980's, China's corn area increased about 10 percent, primarily at the expense of rice area. Because of rising demand, farmers are willing to apply more variable inputs in growing corn. Corn yield growth is the highest among all grain crops. Yield is projected to grow at 1.4 percent per year, reaching nearly 5 tons per hectare in the year 2000.

The majority of China's livestock production remains in a primitive state. Manufactured feed supplies, although increasing rapidly since 1985, accounted for less than 20 percent of total livestock feed in 1989 (4). High on-farm grain stocks—largely rice—have supported rapidly growing livestock production. However, eliminating price subsidies on urban grain consumption is likely to raise the cost of backyard livestock production and help develop a manufactured feed industry and livestock specialization. With increased use of manufactured feeds, the demand for corn, wheat, and soybeans will increase, and feed use of rice will decrease. As a result, China's net exports of corn are projected to decrease from over 6 million tons in 1989-91 to less than 3 million tons in the year 2000.

Although China's corn exports accounted for less than 5 percent of world corn exports between 1988 and 1990, China is a significant player in Asian markets. With increasing autonomy, northern China likely will export corn to the neighboring countries of South Korea, North Korea, and Japan while southern China will import U.S. corn to support its expanding livestock industry. During the 1990's, reduced net corn exports and growing imports from southern China will create market opportunities for the United States and others in China and neighboring markets.

Oilseeds

China now accounts for 15-18 percent of world oilseed production. Major oilseed crops are peanuts, rapeseed, cotton, and soybeans. Except for peanuts, China's share of oilseed trade has been very small. In response to increased meat and vegetable oil production, more acreage will shift into soybean and rapeseed production. However, increasing demand is projected to sharply reduce exportable surpluses of both soybeans and soymeal by 2000.

Cotton

After grains, cotton is the most important agricultural commodity produced in China, accounting for 4 percent of total area. Cotton production increased rapidly to support fast growing rural textile enterprises, growing from 2.2 million

Table C-2. China: Base projections for livestock

	Growth rates				
	1979-1981 avg.	1989-1991 avg.	2000	1980-90	1990-00
	-----Million tons-----			---Percent---	
Pork					
Production	11.08	22.85	28.67	7.51	2.29
Net exports	.10	.11	.35	.63	12.27
Consumption	10.98	22.74	28.32	7.56	2.22
Poultry meat					
Production	N/A	3.14	6.66	N/A	7.81
Net exports	.00	.47	.05	**	-20.07
Consumption	N/A	2.67	6.61	N/A	9.49
Beef					
Production	.03	1.29	2.71	44.01	7.71
Net exports	.00	.10	.27	**	10.44
Consumption	.03	1.19	2.43	42.85	7.40

** = incalculable value

tons in 1978 to 5.7 million in 1991. China was a net importer of cotton in the early 1980's, but the GOC has continued to use its pricing policy to increase domestic production. For several years in the mid-1980's, China was a net cotton exporter.

Continued growth in the textile industry will cause demand for cotton to increase. However, the high stock/consumption ratio and lower world prices will curb import demand for some time into the future, resulting in China remaining a minor net exporter in the 1990's.

Meats

Pork accounts for over 80 percent of meat production and consumption in China.^{4/} Economic reforms have doubled production over the last decade. China's share of world pork production has continued to increase, rising from about 15 percent in 1980 to 30 percent currently.

The base projections assume the desire to diversify meat consumption, resulting in faster growth in the poultry and beef sectors than in pork. Pork consumption is projected to increase 25 percent by the year 2000, while poultry and beef consumption will more than double from current levels (table C-2). For all meats, domestic production is expected to increase sufficiently to support higher consumption over the next decade.

4/ In this paper, meat products do not include fish products, which account for about a quarter of total meat consumption in China.

High Income Scenario

Economic performance in China over the past few years, coupled with the ongoing reforms, suggests that income growth may surpass the 6 percent rate assumed in the base projections. To test the sensitivity of the base projections to higher income growth, an alternate scenario was projected in which income growth was raised 1 percentage point above the base rate.

Results of the high-income scenario indicate increases in demand for wheat, meats, and feeds, and a decrease for rice from base levels (tables C-3 and C-4). However, it is not anticipated that the changes in demand patterns would be fully met by corresponding changes in trade because production would also respond to changing demand. However, the estimated effects of stronger income growth are sufficient to shift China's net trade position to net importer of corn, soybeans and meal, and cotton. Additional income growth could be expected to further increase import requirements, especially of feeds.

Alternate Adjustment Scenario

The base scenario provides projections of China's agricultural production, consumption, and trade, based largely on the continuation of past trends and economic relationships.

Although the base projections recognize changes in consumption patterns during economic growth, they do not account for effects of the more fundamental changes possible in China's agricultural economy during the 1990's. An alternate scenario attempts to account for the potential impact of more fundamental changes in underlying economic parameters by examining the aggregate impacts of: 1) changes in China's food consumption patterns in the 1990's following patterns observed in Taiwan during the 1970's and 1980's, 2) continuing GOC concern for maintaining food self-sufficiency, and 3) the potential for agricultural production to adjust to changes in the pattern of food demand.

In the alternate adjustment scenario, the new set of demand parameters results in a faster projected decline in rice consumption compared with the base scenario (table C-5). The scenario allows land to shift out of rice cultivation, and into wheat, corn, soybeans, and cotton, in order to minimize grain and oilseed imports. The shift of marginal land from rice to wheat is expected to increase average rice yields and reduce average wheat yields compared with the base projection. Without shifting land out of rice production, China would have 27 million tons (from 6 million hectares) of indica rice available for export by the year 2000, while importing roughly 35 million tons of wheat, 15 million tons of corn, 6 million tons soybeans, and 2.5 million tons of cotton.

There are two reasons why China is likely to make adjustments in land use to minimize agricultural imports. First, maintaining grain self-sufficiency has always been China's top priority. As a result, to encourage production, domestic wheat prices have been supported at a higher level than other grains. Second, given the size of China's consumption and

Table C-3. China: Scenario results for crops

	2000		
	Base	High income growth	Alternative
	Million tons		
Rice			
Area (Mil. ha)	32.6	32.1	26.8
Yield (Kg/ha)	4.1	4.1	4.5
Production	134.3	132.3	120.6
Net imports	-.5	-.5	.0
Consumption	133.5	131.8	120.6
Wheat			
Area (Mil. ha)	30.7	31.2	33.3
Yield (Kg/ha)	3.6	3.6	3.3
Production	109.3	111.1	110.0
Net imports	17.4	19.3	26.1
Consumption	126.1	129.9	136.1
Corn			
Area (Mil. ha)	21.5	21.5	23.0
Yield (Kg/ha)	5.0	5.0	4.9
Production	106.4	106.6	112.4
Net imports	-2.8	.2	5.4
Consumption	103.7	106.8	117.8
Soybeans			
Area (Mil. ha)	8.2	8.2	8.2
Yield (Kg/ha)	1.6	1.6	1.5
Production	12.9	12.9	12.2
Net imports	-.3	.3	5.1
Consumption	12.6	13.2	17.8
Soymeal			
Production	4.8	5.0	8.0
Net imports	-.9	.1	2.0
Consumption	3.9	5.1	10.0
Cotton			
Area (Mil. ha)	6.5	6.5	6.6
Yield (Kg/ha)	.9	.9	.9
Production	5.9	5.9	6.0
Net imports	-.3	.3	-6.0
Consumption	5.7	5.8	.0

production, even small changes would have a large impact on international trade. Rice consumption is projected to decline as per capita income increases and urban subsidies are removed. Unless China makes adjustments in rice production, the amount of rice available for export would depress world prices sharply. Given the inelastic demand for rice in the world market, total foreign earnings from rice exports

Table C-4. China: Scenario results for livestock

	2000		
	Base	High income growth	Alternative
	Million tons		
Pork			
Production	28.7	29.5	33.0
Net imports	-.4	.0	.0
Consumption	28.3	29.5	33.0
Poultry			
Production	6.7	7.1	5.4
Net imports	-.1	-.1	.0
Consumption	6.6	7.1	5.4
Beef			
Production	2.7	2.8	2.3
Net imports	-.3	-.2	.0
Consumption	2.4	2.6	2.3

Table C-5. China: Estimated income elasticities under two scenarios

	Base	Alternative
Rice	-.17	-.42
Wheat	.12	.20
Pork	.28	.50
Beef	1.28	1.10
Poultry	1.41	1.14
Rapeseed oil	.20	.95

could fall despite a large increase in exports. On the other hand, the increase in China's demand for corn, soybean, and cotton imports could push world prices higher than the cost of reallocating land resources to their production.

Under the alternate adjustment scenario, it is assumed that the additional feed grains required for higher meat production will come from manufactured feed. The feed grain-to-meat conversion ratios for increased livestock production are assumed to be 4.35 for pork, 8.0 for beef, and 2.6 for poultry (7). Corn and soybean meal are assumed to account for 35 percent and 8 percent, respectively, of manufactured feed (4). Income elasticities of nonfeed demand for corn and soybeans are assumed to be zero. The derived income elasticities are 0.35 for corn and 0.47 for soybeans.

The projected 6.0 million hectare surplus in rice sown area in the alternate adjustment scenario is shifted into production of wheat, corn, soybeans, rapeseed, and cotton (table C-3). The surplus rice area is assumed to be allocated to alternate

crops according to their shares of total cropped area. Thus, rice production is projected to decline at the same pace as rice consumption, and area is shifted to other crops. Rice yield growth under the alternate scenario is modest, despite a significant decrease in sown area, because japonica varieties will account for an increasing proportion of rice area.

If surplus rice area were not shifted to corn, demand for corn would exceed production by nearly 15 million tons. However, with 3 million hectares of surplus rice land shifted to corn, an additional 9.4 million tons of corn would be produced. With this additional production, projected corn imports in the alternate scenario are 5.4 million tons in the year 2000. Similarly, if no rice area is shifted to wheat, wheat imports would rise to nearly 35 million tons by 2000. However, a shift of 2.6 million hectares of surplus rice area into wheat boosts production and holds imports to about 26 million tons.

In the alternate adjustment scenario, soybean imports in the year 2000 rise to 5.1 million tons and soymeal imports to 2 million tons, even with 0.7 million hectares of rice area reallocated into producing about 1 million tons of additional soybeans. About 0.5 million hectares of surplus rice area are converted to producing cotton, but cotton imports still rise to a projected 1 million tons by the year 2000.

Conclusions

Higher income growth and marketing reforms in the next decade will lead to a very different food consumption pattern in the year 2000 compared with the previous four decades. Rice consumption is projected to decline while consumption of other farm products is projected to increase rather sharply. China's transformation from a centrally planned to a more market-oriented economy will stimulate income growth, which will rapidly expand consumer demand for agricultural products. In the long term, China could be a major market for U.S. soybean and oilseed exports. Also, China's corn exports are projected to decline sharply, likely increasing the U.S. share of the East Asian corn market.

In the short term, however, the removal of price subsidies is likely to have an adverse effect on U.S. agricultural exports to China as existing large stocks of agricultural commodities are reduced. Decreased per capita food grain consumption could significantly reduce the need for grain stocks for food security reasons, making more grain—especially corn—available for export in the near term. To prevent too drastic a shift from grains to other crops, the GOC will continue its procurement policy and support the negotiated grain prices at a high level to assure a minimum acreage base.

References

1. Banister, Judith, and Wu Harbaugh, "Rural Labor Force Trends in China," *China Agriculture and Trade Report*, Economic Research Service, July 1992.
2. China State Statistical Bureau, *Zhongguo Tongji Nianjian*, (*China Statistical Yearbook*) various issues, China Statistical Publishing House, Beijing.
3. Colby, Hunter, Frederick W. Crook, and Shwu-Eng H. Webb, *Agricultural Statistics of the People's Republic of China, 1949-90*, Statistical Bulletin No.844, Economic Research Service, December 1992.
4. Council of Agriculture, *Basic Agricultural Statistics*, (1989 Edition), Taipei, Taiwan.
5. Crook, Frederick W., "What Direction for China's Ag Economy in 1993?" unpublished working paper, Economic Research Service, January 1993.
6. Ministry of Commerce, *Zhongguo Shangye Nianjian*, (*China Commerce Yearbook*) various issues, China Statistical Publishing House, Beijing.
7. Tuan, Francis C., "China's Feed Industry: Recent Development and Future Plans," *China Agriculture and Trade Report*, Economic Research Service, July 1985.
8. Tuan, Francis C., "U.S.-China Agricultural Trade Over Two Decades," *China Agriculture and Trade Report*, Economic Research Service, July 1992.
9. U.S. Department of Agriculture Livestock and Feed Study Team, *China Livestock and Feed Trip Report*, Economic Research Service, October 1989.
10. U.S. Department of Agriculture, "Agricultural Production," *China Agriculture and Trade Report*, Economic Research Service, July 1991.
11. U.S. Department of Agriculture, "Agricultural Production," *China Agriculture and Trade Report*, Economic Research Service, July 1992.
12. U.S. Department of Agriculture, *Modeling China's Agriculture Trip Report*, Economic Research Service, December 1992.
13. Wu, Tormg-Chuang, *The Demand for Food in Taiwan*, Ph.D. Dissertation, University of California at Davis.
14. Webb, Shwu-Eng, and Hunter Colby, "China's Agricultural Marketing System in the 1980's," *China Agriculture and Trade Report*, Economic Research Service, July 1992.
15. Webb, Shwu-Eng, Alan J. Webb and William T. Coyle, "China's Food Consumption and Production Patterns in the Year 2000: Implications for Trade," *China Agriculture and Trade Report*, Economic Research Service, July 1992.

Global Commodity Price Assumptions

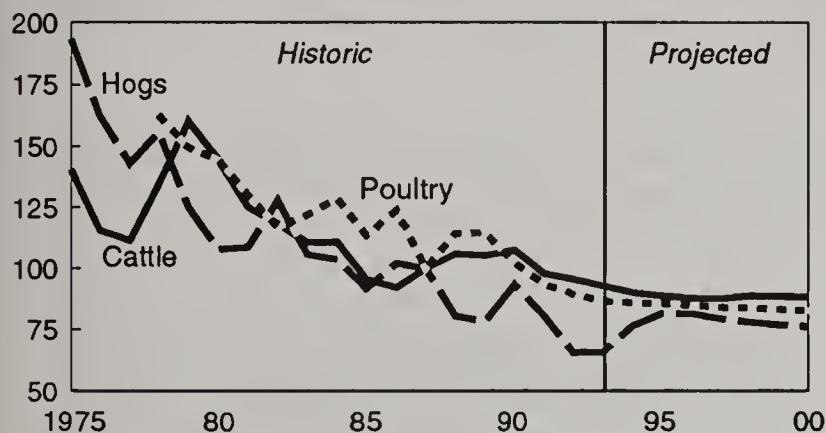
The commodity projections in this report are based on the world price projections shown in the figures below. The projections are generally consistent with a continuation of the historical trend of declining real prices for each major commodity. The future prices have been adjusted to account for the estimated impacts of announced reforms to the Common Agricultural Policy of the EC. No other unilateral or multilateral policy changes are expected to significantly alter historic price trends. Specifically, the prices,

as well as the domestic policies underlying each set of country projections, assume no agreement on agricultural policy reform under the General Agreement on Tariffs and Trade.

The indices shown in the figures are reference prices for indicative commodities and markets. These are: wheat, corn, and soybeans, fob U.S. Gulf; rice, fob Bangkok; soybean meal and oil, fob Rotterdam; cotton, fob Northern Europe; beef, cif New York; pork, cif Tokyo, and; poultry, U.S. wholesale. Where necessary, alternate reference prices more appropriate for analysis of particular country markets have been used in the projections.

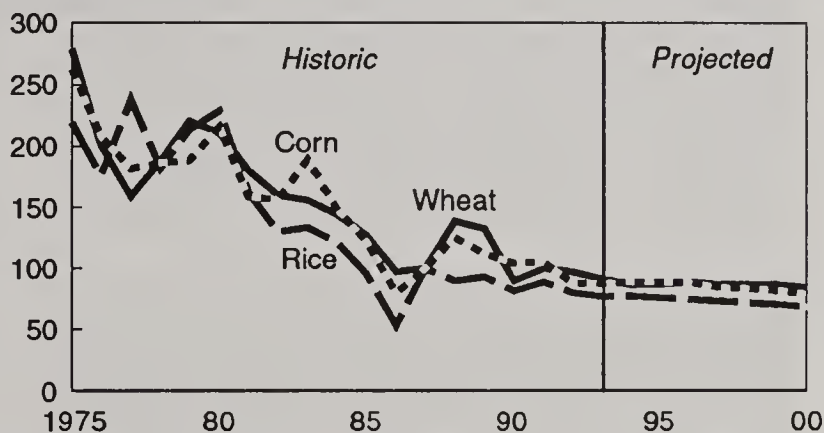
Indices of Real Livestock Product Prices

1987=100



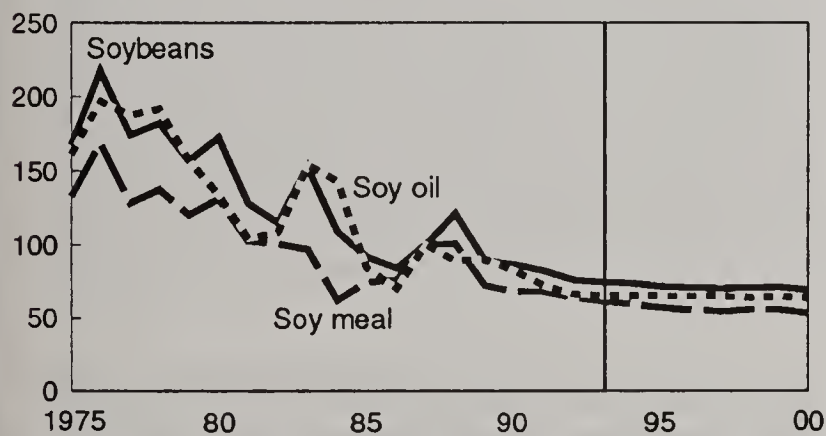
Indices of Real Grain Prices

1987=100



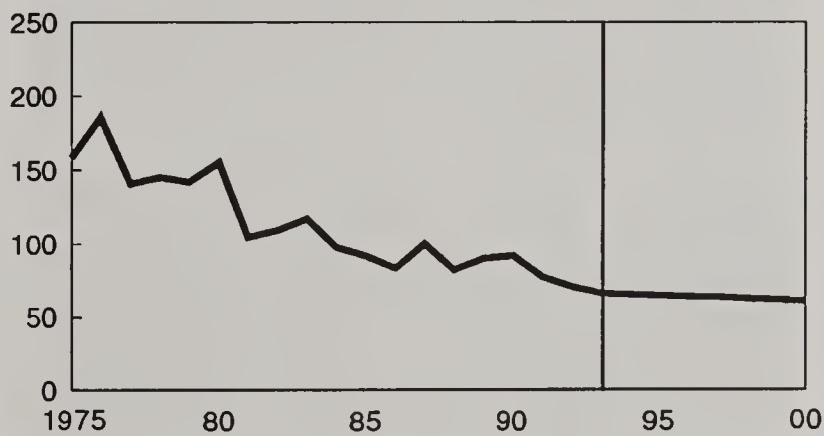
Indices of Real Soy Product Prices

1987=100



Indices of Real Cotton Prices

1987=100



Hong Kong

Lois A. Caplan

Abstract: Hong Kong is Asia's second largest agricultural importer, and the fourth largest U.S. market in the region. Although slower income growth should slow import demand compared with the 1980's, demand for value-added products is expected to remain strong in the 1990's. Competition from Asian suppliers will continue to constrain U.S. market share.

Keywords: Hong Kong, China, agriculture, trade, wheat, rice, meats, cotton.

Introduction

The value of Hong Kong's agricultural imports (estimated at \$7.1 billion in 1991), exceeding that of Taiwan and almost matching South Korea, seems disproportionately high for a city-state of less than 6 million people. But with few agricultural resources, Hong Kong must import an estimated 90 to 95 percent of its food and raw materials. Also, as a result of its role as a transshipment center in the Asia-Pacific region, a significant volume of Hong Kong's agricultural imports is rerouted to mainland China and other Asian countries.

Hong Kong has grown substantially as a market for U.S. farm products during the last two decades. In fiscal 1991, the Territory was the eleventh largest market for U.S. farm exports, worth a record \$745 million. Roughly 70 percent of the value was accounted for by high-value and processed products, such as animal products and fruits and vegetables. The most important U.S. export commodities to Hong Kong include poultry meat, eggs, furskins, feeds and fodders, wheat, citrus fruit, other horticultural products, tobacco, and cotton. The United States is the second largest supplier of agricultural products to Hong Kong after China, with an estimated market share of 11 percent in 1991.

Agriculture's role in Hong Kong's modern, service-oriented economy is very minor, contributing less than 0.5 percent to GDP in 1991. Only about 2 percent of the workforce is engaged in farming and fisheries, and only 8 percent of the Territory's land is arable. Major crops are vegetables, flowers, fruit, and other field crops. Rice production has given way to intensive vegetable cultivation, which is more profitable. Hong Kong supports a small and declining livestock industry, chiefly poultry and pork production, and some dairy farming. Many livestock farmers in the Territory have quit since June 1988, when the Livestock Waste Control Law took effect. The Government's 10-year plan to control water pollution from animal waste bans livestock production in urban areas, and imposes strict water pollution controls on the remaining farms.

Economic Trends and Policies

Under the Sino-British Joint Declaration, ratified in May 1985, British sovereignty over Hong Kong will be transferred to China in 1997. As a Special Administrative Region (SAR), Hong Kong will be allowed a high degree of autonomy, except

in foreign affairs and defense. Under its "one China, two systems" doctrine, China has promised that Hong Kong can maintain its capitalistic economy and open lifestyle for 50 years after 1997. Hong Kong's future constitutional document, the Basic Law, which was promulgated in April 1990, embodies these principles.

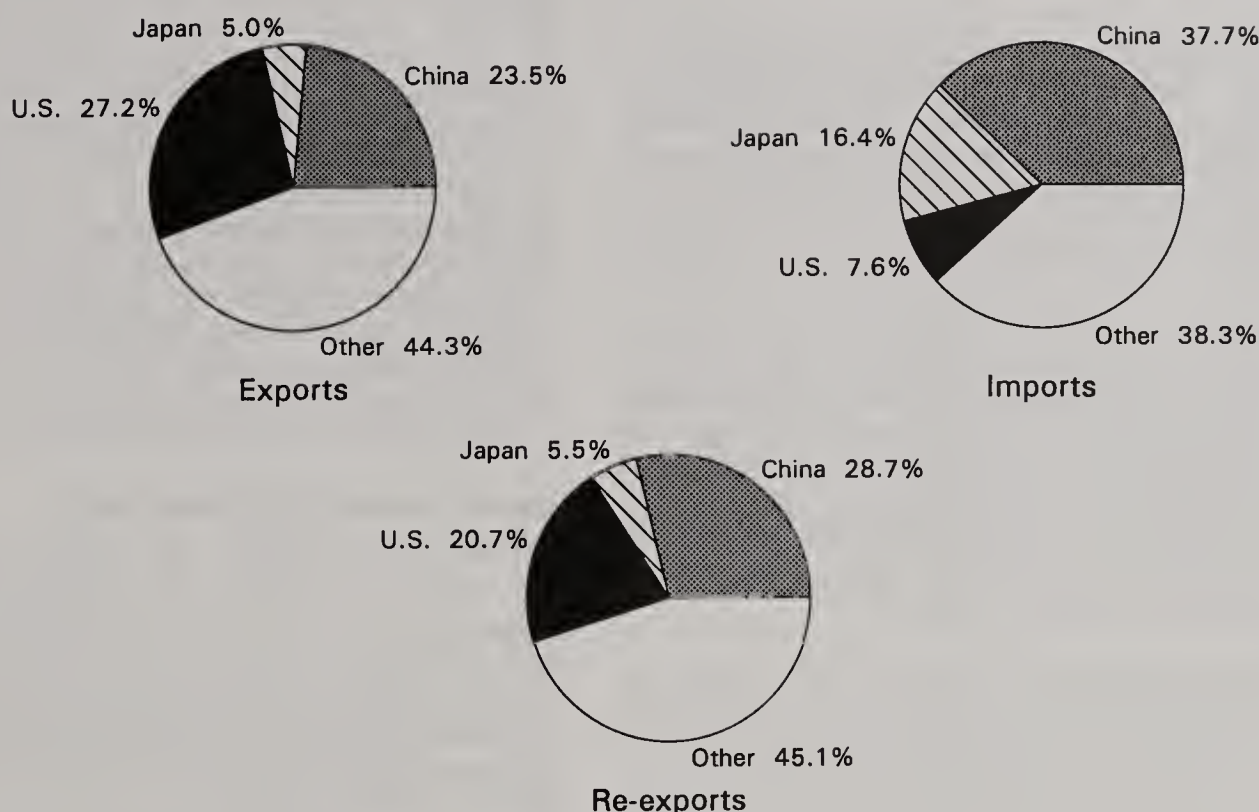
Hong Kong's economy grew rapidly during 1975-84, but slowed to less than 1 percent in 1985, mainly because of a decline in domestic exports. Following robust growth during 1986-1988, GDP growth weakened during 1989-1991, in the midst of a cyclical slowdown. China's crackdown on student protesters in June 1989 precipitated a decline in consumer spending, property transactions, tourism, and investor confidence in the Territory, and GDP growth slowed to 2.3 percent that year. Economic growth remained sluggish in 1990 and 1991, constrained by more moderate foreign demand for Hong Kong's goods.

Hong Kong's economy expanded by 5 percent in 1992, boosted by domestic demand and merchandise re-exports. A multi-billion-dollar infrastructure project to build a new airport and two new container terminals by 1997 should aid Hong Kong's economy in the next 5 years. Reunification with China is not expected to create any major upheaval in Hong Kong, although political struggles in China could hinder Hong Kong's business and economic developments in the long term by undermining confidence in the Territory's stability.

Hong Kong manufacturers continue to be plagued by a shortage of skilled workers. Because of fears about the future after 1997, in recent years about 60,000 mostly middle-class Hong Kong Chinese have emigrated annually to Canada, Singapore, Australia, the United States, and other countries. This exodus has caused a "brain drain" since many of these emigrants had filled managerial or other professional positions.

Over the last two decades, the manufacturing sector's contribution to the economy and its share of the workforce has declined, while the service sector has grown in importance. Textile and clothing industries are the dominant manufacturing activities in the Territory. Other principal industries include electronics, watches and clocks, plastics, and electrical appliances.

Figure D-1

Hong Kong: Trade with Major Partners, 1991

The Hong Kong Government has pursued a balanced budget strategy. According to an agreement with China, outstanding government debt cannot exceed HK\$5 billion (US\$641 million) when the Territory reverts to Chinese control in 1997. A relatively simple tax structure with low tax rates by world standards provides incentives for both wage-earners and investors. Unlike most major economies, Hong Kong has no central bank. The government can influence liquidity and interest rates in the interbank market through the operations of the Exchange Fund, which holds the bulk of the government's financial assets, mainly in the form of bank deposits and marketable interest-bearing instruments in foreign currencies. The statutory role of the Fund is to influence the exchange value of the Hong Kong dollar, whose stability is maintained by intervention in local or foreign currency markets.

Trade Performance and Policies

Trade is vitally important to the economy of Hong Kong, and it is among the world's top 11 traders. During the 1980's, Hong Kong's domestic exports grew at an average annual rate of 8 percent (in real terms); re-exports, 23 percent; and imports, 13 percent. In 1991, real growth for domestic exports (by value) was 2.3 percent; for re-exports, 29.2 percent; and for imports, 21.2 percent.

Hong Kong's largest overall trading partner is China, followed by the United States and Japan. The United States remains the leading destination for Hong Kong's products, although its share has been declining in recent years (see figure D-1).

China recently became Hong Kong's second largest market for domestic exports. China is especially important in Hong Kong's re-export trade, as the largest market for and supplier of its re-exports.

China's importance to Hong Kong both as supplier and outlet for domestic goods has strengthened over the past decade. In 1991, nearly 38 percent of the Territory's total merchandise imports came from China, up from 20 percent in 1980, while 24 percent of its domestic exports were destined for China, up from 2 percent a decade earlier. In addition, almost 29 percent (by value) of the goods transshipped via Hong Kong in 1991 went to China, compared with 15 percent in 1980.

Hong Kong plays an important role as a transshipment center in the Asia-Pacific region, importing and re-exporting raw materials and manufactured goods (with little or no change of the goods). In recent years, a substantial amount of indirect trade has taken place between Hong Kong and other Asian countries, especially China. The reason is the lack of diplomatic relations between some countries, such as China and Taiwan and, until August 1992, China and South Korea.

As these countries establish stronger economic and political ties with each other, indirect trade via Hong Kong will become less important. China has already begun development of port and other infrastructure projects in southern China to service its exports from this area. In the long term, some of the projects, particularly a new container port at Yantian (just across from Hong Kong's northeastern border), could become competition for Hong Kong. Moreover, as more and more manufacturers in the region relocate to lower-cost labor areas

in Southeast Asia, the volume of goods transshipped through the port of Singapore will increase, perhaps at the expense of Hong Kong.

Since the adoption of more open trade policies by China in the late 1970's, Hong Kong's economic links with China have grown rapidly. For Hong Kong, China is both a market and a production base. Because of lower land and labor costs in China, a growing number of labor-intensive operations have transferred from Hong Kong to the mainland, particularly in neighboring Guangdong Province.

Hong Kong is also vital for China. It provides important services, such as port and airport facilities, financial institutions, and other business services. China has invested heavily in Hong Kong. Its investments span traditional areas like banking, import/export, wholesale/retail, and transportation, to newer activities like property development, financial services, manufacturing, and infrastructural projects. Japan is the second largest source of foreign investment in Hong Kong after China, with the United States third.

The Hong Kong dollar has been linked to the U.S. dollar at the rate of HK\$7.80 to US\$1.00 since October 1983. Thus, the price competitiveness of Hong Kong's exports is affected by the value of the U.S. dollar relative to that of other currencies. The Hong Kong Government continues to stress the importance of the HK-U.S. dollar link to the stability of Hong Kong's economy.

The Hong Kong Government adheres to a free trade policy, and imposes almost no controls on trade and industry. There are no tariff barriers, although the Government imposes specific duties on six groups of commodities—hydrocarbon oils, alcoholic liquor, methyl alcohol, tobacco, non-alcoholic beverages, and cosmetics—for revenue-raising purposes. A 5-percent tax on soft drinks, in place since 1985, was abolished in March 1992.

Hong Kong has been a GATT member since 1986, and will retain its status after 1997. In order to meet its obligations under bilateral agreements to restrain exports of certain textiles and apparel, Hong Kong's trade department administers an export control system. The government is concerned about heavy dependence on the United States as an export market, and the \$15 billion trade surplus with the United States. As a result, the government encourages diversification of export markets, as well as increased imports from the United States.

Agricultural Trends and Policies

As a result of the mid-1989 events in China, the Hong Kong Government initiated a new farming policy to reduce the Territory's dependence on food imports from China. The Agriculture and Fisheries Department would like to turn fallow land in the New Territories (abutting mainland China) into arable land, producing vegetables, pigs, and poultry. It is unlikely that vegetables or livestock products will increase significantly during the 1990's, however, because of Hong Kong's limited land base, land encroachments from continuing development of towns, new infrastructure projects, and strict controls on animal waste. The government's land use

(zoning) policy is seen as being important for agricultural development in the long run. In the 1970's and early 1980's, many new towns and roads were built on existing farmland and fields.

The Hong Kong Government imposes no restrictions on trade and consumption of agricultural products, apart from duties on alcoholic and non-alcoholic beverages, cigarettes, and unmanufactured tobacco products. In Hong Kong, per capita consumption of many foods is among the highest in East Asia. Relatively high and rising per capita incomes over the past decade have spurred demand for Western foods and more diverse and convenience-oriented food products. The trend toward increased consumption of these kinds of foods is expected to continue as tastes evolve and the standard of living continues to improve in the Territory.

Issues Affecting Agricultural Trade in the 1990's

Hong Kong's real GDP growth is projected to average 5.9 percent per year over the forecast period, lower than the average 6.5 percent growth attained during 1980-91. This projected rate seems reasonable, given expected growth of 5.5 percent in 1993 and the likelihood that the Hong Kong economy will benefit from increasing links with the rapidly expanding Chinese economy.

Following a 9.3 percent rise in 1991, consumer price inflation is forecast to moderate over the decade to an average 4.9 percent annually. However, inflation could be higher if labor shortages persist, and government policy does not permit entry to sufficient foreign labor. Annual population growth is projected to decline from 0.56 percent in 1993 to 0.44 percent in 2000.

Hong Kong's nominal exchange rate is expected to remain near the officially-pegged rate of HK\$7.8 per 1 U.S. dollar during the forecast period. However, if inflation in Hong Kong exceeds the United States, foreign goods could become relatively cheaper compared with domestic products at the HK\$ 7.8=US\$ 1 exchange rate. This should cause Hong Kong's imports to increase and exports to decrease.

The most important factor influencing economic development in Hong Kong before and after 1997 will be the political and economic directions taken by China. China's already powerful influence over Hong Kong's economy is likely to become even greater as a result of increasing economic links with southern China. Hong Kong's trade-dependent economy will also remain vulnerable to the economic conditions of its other major export markets, especially the United States and Japan.

Trade Policies

Hong Kong's economy remains vulnerable to a potential cooling of U.S.-China relations. The U.S. Congress's renewed debate on China's most-favored-nation (MFN) status in 1992 worried Hong Kong exporters because a large volume of Chinese goods is shipped through Hong Kong. Despite its open economy, Hong Kong could be adversely affected

by protectionist measures aimed against it or against China. Some labor-intensive industries such as textiles, toys, jewelry, and footwear would likely be harmed if more restrictive trade measures are adopted by the U.S. Government. The base scenario assumes that the United States will maintain peaceful trade relations with China. However, any change in this relationship would have a direct and adverse impact on Hong Kong's prosperity.

As one of the world's largest textile and apparel producers, Hong Kong will be affected by changes in the current rules governing global textile trade. However, in the base scenario, the quota system under the Multi-Fiber Arrangement is assumed to continue. In 1991, Hong Kong's 1986 bilateral textile accord with the United States was extended for four years. There were no major changes to existing quotas or conditions.

Agricultural and Trade Prospects to 2000

Hong Kong's imports and consumption of livestock products will continue to grow during the 1990's, but probably not as fast as during the 1980's. This is chiefly because more moderate income growth and slower population growth is predicted for the current decade. Pork and poultry meat from local farms will comprise a shrinking share of total consumption as producers continue to leave the industry. Per capita rice consumption will continue to trend down, while wheat demand will increase very slowly over the decade.

Beef

Per capita beef consumption in Hong Kong averaged 13.9 kilograms in 1989-91, and is projected to increase to 16.2 kilograms by 2000 (table D-1). Total beef consumption is forecast to rise 22 percent by 2000. Nearly half of the beef consumed in the Territory in 1991 was produced from imported live cattle, mostly from China, and half was imported chilled or frozen meat. Beef production from domestic cattle is negligible. The tendency to increase consumption of frozen meat (used mainly in restaurants and fast food outlets) relative to freshly-slaughtered meat is expected to continue.

Beef imports (including chilled, frozen, and live cattle slaughtered for fresh meat) are projected to expand in line with consumption, reaching 100,000 tons in 2000. Chinese beef (including fresh beef produced from imported live cattle) accounts for the majority—60 percent in 1991—of Hong Kong's beef supply. However, South American suppliers, such as Argentina, Brazil, and Uruguay, have made significant inroads in recent years. New Zealand is aiming to capture a larger share of the hotel and restaurant trade at the upper end of the market.

The U.S. share of Hong Kong's beef imports (chilled and frozen) has grown since the mid-1980's and was 11.4 percent in 1991. U.S. beef is mostly restricted to high-quality cuts for the hotel and restaurant trade, because it is generally higher-priced than beef from other sources.

Pork

Hong Kong's per capita pork consumption—the highest among East Asian countries—is projected to rise from an average of 42.6 kilograms in 1989-91 to 44.9 kilograms in 2000. Total pork consumption is forecast to increase 13 percent over the period, reaching 280,000 tons by 2000.

Pork produced from domestic hogs and imported live hogs, mainly from China (China shipped 2.8 million head to Hong Kong in 1991), makes up about three-fourths of total pork consumption, with the remainder being imported frozen pork. Processed products, such as ham and bacon, currently comprise only a very small share of total consumption. While the mostly Chinese population in Hong Kong prefers freshly-slaughtered pork from domestic and Chinese hogs, frozen pork is gaining ground. Frozen pork is used mainly in hotels, restaurants, and fast food outlets.

Table D-1. Hong Kong: Base projections for meats

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Beef					
Production	.00	.00	.00	.0	.0
Net imports	.06	.08	.10	3.3	2.3
Consumption	.06	.08	.10	3.3	2.2
Per cap.(Kg)	11.5	13.9	16.2	1.9	1.5
Ending stocks	.01	.01	.01	.0	2.9
Pork					
Production	.02	.02	.01	.0	-9.6
Imports	.18	.22	.27	2.0	1.8
Consumption	.21	.24	.28	1.8	1.2
Per cap.(Kg)	40.7	42.6	44.9	.5	.5
Ending stocks	.01	.01	.01	1.3	1.2
Poultry					
Production	.04	.03	.02	-2.9	-3.7
Imports	.08	.24	.32	11.8	2.9
Exports	.00	.07	.10	53.6	3.0
Consumption	.12	.20	.24	5.1	2.1
Per cap.(Kg)	23.8	34.4	39.5	3.8	1.4
Ending stocks	.01	.01	.01	.0	1.8

Note: Import figures for beef and pork include imported live animals converted to carcass weight equivalent; live poultry imports are converted to a ready-to-cook basis by multiplying by 0.88 for chickens, 0.78 for ducks and geese, and 0.7 for other poultry.

Sources: Production figures from Hong Kong yearbooks 1979-81; trade figures from Hong Kong Trade Statistics, December issues, or estimated from January-November data.

Pork production in the Territory is forecast to continue to decline because of strict waste disposal laws and a ban on livestock production in urban areas, where about half of the existing livestock farms are located. Many smaller operators have been forced out of business because of the high costs involved in meeting treatment and disposal standards. However, larger farms reportedly have been able to adjust to the stricter anti-pollution measures, and total pork output is expected to increase slowly in the next few years.

Pork imports are projected to expand 17 percent to 270,000 tons in 2000. The majority of these imports is likely to continue to be sourced from Chinese hogs and Chinese frozen pork, although South American suppliers, such as Brazil and Argentina, are rapidly emerging in this market. The U.S. share is currently very small (less than 1 percent), but there is potential demand for high-quality U.S. frozen and chilled pork.

Poultry

Hong Kong's per capita poultry meat consumption, which is the highest among the East Asian countries, averaged 34.4 kilograms in 1989-91, and is projected to rise to 39.5 kilograms by 2000. Hong Kong citizens consume a wide variety of poultry meat, including chickens, ducks, geese, pigeons, quails, and turkeys. Total poultry meat consumption is forecast to expand 13 percent and reach 240,000 tons by 2000.

Because of strict anti-pollution measures in the Territory, domestic poultry production (predominantly chicken meat) continued to decline in 1991, accounting for an estimated 11 percent of the total poultry meat supply. The future does not look bright for Hong Kong's poultry industry, and it is expected to decline further, at least until the government's anti-pollution program is completed in 1996.

Poultry meat imports (including frozen poultry and live birds slaughtered for fresh meat) are projected to rise 13 percent to 320,000 tons in 2000. A key uncertainty for import projections is the volume of poultry meat re-exports, which go mainly to China. Re-exports have increased markedly since the late 1980's and are estimated at 97,000 tons in 1992. Poultry meat re-exports are assumed to average 98,000 tons per year over the forecast period, but could be higher.

While Hong Kong consumers prefer freshly-slaughtered poultry meat, frozen poultry (mostly chicken parts) has become more popular in recent years in fast food and other restaurants, as well as at home. Frozen poultry now accounts for an estimated three-quarters of the Territory's poultry meat imports (including live birds converted to a ready-to-cook basis), up considerably from a few years earlier. Frozen poultry has gained a larger share of Hong Kong's poultry meat imports because of lower prices and greater convenience than live poultry. The United States is the dominant supplier, with significant amounts also coming from Brazil, the EC, and Japan. Prospects for live bird imports will depend on China's supplies and export policy.

Table D-2. Hong Kong: Base projections for grains

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Rice					
Area (Mil. ha)	.00	.00	.00	.0	.0
Yield (Kg/ha)	.00	.00	.00	.0	.0
Production	.00	.00	.00	.0	.0
Imports	.36	.39	.37	.8	-.4
Exports	.01	.04	.04	22.8	.0
Consumption	.36	.35	.34	-.1	-.4
Food	.36	.35	.34	-.1	-.4
Per cap. (Kg)	70.6	61.3	55.3	-1.4	-1.0
Feed	.00	.00	.00	.0	.0
Ending stocks	.00	.00	.00	.0	.0
Wheat					
Area (Mil. ha)	.00	.00	.00	.0	.0
Yield (Kg/ha)	.00	.00	.00	.0	.0
Production	.00	.00	.00	.0	.0
Imports	.18	.30	.32	5.4	.6
Exports	.01	.08	.08	24.3	.0
Consumption	.17	.22	.24	2.8	.8
Food	.17	.22	.24	2.8	.8
Per cap. (Kg)	33.3	38.5	39.2	1.5	.2
Feed	.00	.00	.00	.0	.0
Ending stocks	.00	.00	.00	.0	.0

Note: Wheat imports and exports include wheat flour converted to a wheat equivalent basis derived by dividing wheat flour by 0.77.

Rice and Wheat

Per capita rice consumption in Hong Kong fell during the 1980's, and is expected to continue to decline during the 1990's (table D-2). Similarly, total rice consumption and imports are expected to decline over the decade. During 1989-1991, Hong Kong re-exported an average 39,000 tons of rice per year, and nearly the same amount is projected to be re-exported annually over the forecast period. In recent years, rice re-exports were destined mainly for China and Macau.

Hong Kong's wheat imports remained flat during the 1980's, but wheat flour, which came mostly from Japan, more than tripled. In recent years, Hong Kong re-exported about one-third of its wheat flour imports, mainly to China and Vietnam. Per capita wheat consumption in the Territory, which is about the same level as other East Asian countries, grew around 16 percent during the 1980's, but is projected to rise very slowly during the 1990's.

Table D-3. Hong Kong: Base projections for cotton

	Growth rates			
	1979-1981	1989-1991	2000	
	avg.	avg.	1980-90	1992-00
	-----Million tons-----		---Percent---	
Cotton				
Area (Mil. ha)	.00	.00	.00	.0
Yield (Kg/ha)	.00	.00	.00	.0
Production	.00	.00	.00	.0
Imports	.20	.23	.26	1.7
Exports	.01	.04	.05	9.6
Consumption	.18	.20	.20	.8
Ending stocks	N/A	.06	.06	.0

Source: Import and export figures from Hong Kong Trade Statistics, December issues, or estimated from January-November data.

Table D-4. Hong Kong: Results of high-growth scenario

	Base	High growth	Percent change
	Million tons		
Net imports			
Wheat	.24	.25	2.5
Rice	.34	.33	-1.8
Cotton	.21	.21	.0
Beef and veal	.10	.10	2.0
Pork	.27	.27	1.5
Poultry	.22	.22	1.4

Cotton

Hong Kong's textile industry continues to face strong competition from cotton yarn imports (mainly Chinese and Pakistani yarns) and a labor shortage. With the continued slowdown in the industry since 1988/89, several more mills in the Territory have closed down in the last few years, dampening cotton consumption.

Major cotton suppliers to Hong Kong include the United States, Pakistan, India, Brazil, Argentina, Australia, and China. Reduced export availability of lower-grade cotton from China, which is used mainly in denim yarn production, has caused Hong Kong spinners to turn increasingly to Brazil and Pakistan for substitutes. The U.S. share of Hong Kong's cotton imports has improved significantly since 1987/88.

Raw cotton consumption in the Territory is projected to remain constant at the 1989-91 average level through the 1990's (table D-3). Net imports are forecast to mirror consumption trends.

Cotton re-exports are assumed to be about one-fifth of total imports over the forecast period.

Impacts of Higher Income Growth

An alternate income growth scenario estimates the trade effects of stronger economic growth by increasing the real GDP growth rate 1 percent from that assumed in the base projections. Under this scenario, only slight changes in net trade are projected for the forecast commodities (table D-4). Consumption of most of the projected commodities is unresponsive to income growth at the current per capita income and consumption rates. Similarly, somewhat lower income growth than assumed in the base scenario is likely to have a relatively small impact on the base projections.

Conclusions

During the 1990's, Hong Kong is expected to experience more modest economic growth than realized during most of the 1970's and 1980's, and slower population growth than during the last decade. Based largely on these economic assumptions, growth in consumption of meat and poultry products is expected to slow down during the 1990's. Per capita consumption of rice is expected to continue its slide, while wheat is forecast to expand only slightly. In addition, the Hong Kong textile industry's demand for imported raw cotton will likely contract during the 1990's as the sector is pressured by serious labor shortages and cotton yarn imports.

Despite already high food imports and slowed demand for some farm products, Hong Kong's food imports will probably continue to expand in the 1990's. First, remaining farmland will gradually be taken over by urban development. Second, demand for high-value and processed products is expected to continue strong as a result of improving incomes and greater demand for convenience foods.

Although the value of U.S. agricultural exports to Hong Kong has increased significantly over the past 5 years, the U.S. share of Hong Kong's food imports has remained fairly steady, averaging around 13 percent. The U.S. share will probably not improve much during the 1990's, given strong competition from low-cost, nearby suppliers such as Thailand, Australia, Taiwan, Singapore, and Indonesia. These countries all gained market share over the past 5 or 6 years. Thailand has been especially successful in marketing tropical fruits, chicken, snack foods, rice, and various packaged products. European exporters, on the other hand, provide little competition in the Hong Kong market, except for certain commodities such as dairy and poultry products, brandy, wine, and packaged products.

While China remains Hong Kong's leading food supplier, its share slipped from over 40 percent in 1987 to roughly 33 percent in 1991. China's share is likely to decline as long as Hong Kong consumers continue to switch to more convenience-oriented and processed foods, and demand higher quality products. However, improvements in China's processed foods industry and agricultural product marketing could make its food products more attractive in the future.

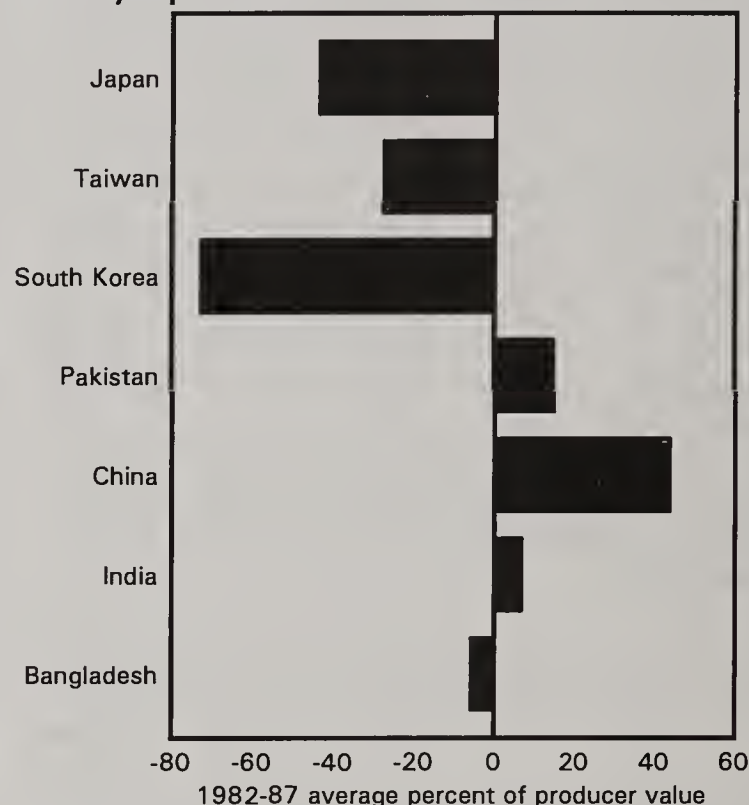
Policy Intervention in Asian Agriculture

Both the direction and degree of agricultural policy intervention vary significantly across Asia's diverse economies. Asia's higher income countries (excluding Australia and New Zealand) tend to support producers and tax consumers through a combination of domestic support and tariff and nontariff trade barriers. Lower income countries tend to tax producers and subsidize consumers, primarily through controls on trade that keep domestic prices relatively low.

These patterns largely reflect differences in the pressures that shape agricultural policy at different stages of development. In the absence of a multilateral agreement to significantly reform global agricultural policies, country policies can be expected to evolve in the direction of domestic and bilateral pressures for change. Changes in policy, in turn, will be a key factor in future developments in supply, demand, and trade.

- In higher income countries, high producer support stems from political pressure to maintain incomes and employment in increasingly uncompetitive farm sectors and from national concerns about food security. High consumer costs have been tolerated because food accounts for a smaller share of consumer budgets at higher

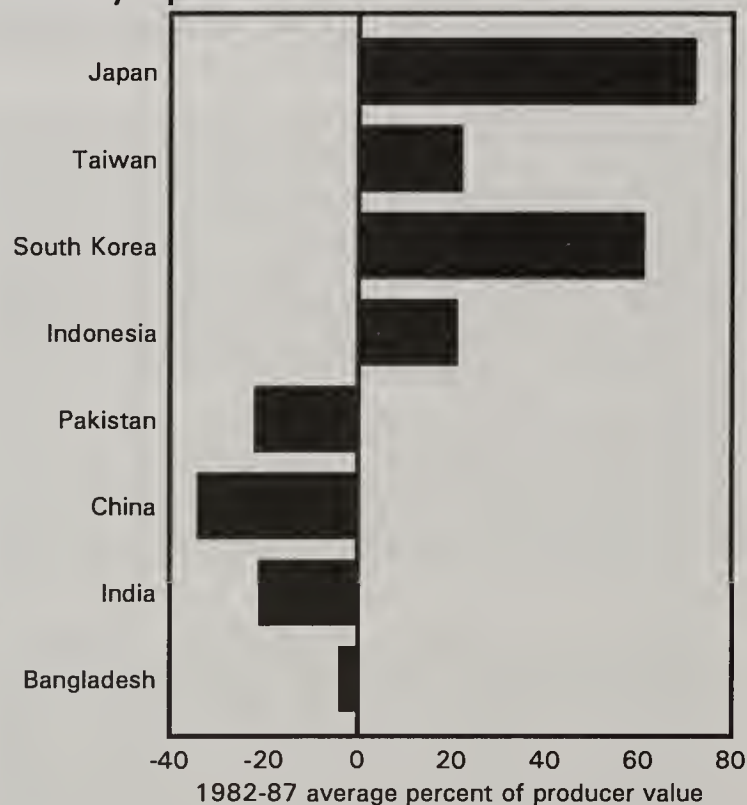
Selected Asian Countries: Total Consumer Subsidy Equivalents



1) A CSE estimates the cost or benefit to consumers of government intervention

2) Countries ranked by 1989 per capita income

Selected Asian Countries: Total Producer Subsidy Equivalents



1) A PSE estimates the cost or benefit to producers of government intervention

2) Countries ranked by 1989 per capita income

income levels. While producers continue to have political clout, there are growing pressures to reduce support. These include bilateral disputes with trade partners, rising consumer costs, budget deficits, and concerns with the environmental impacts of intensive production practices employed under high support. Over time, these pressures may lead to reforms that slow production and stimulate consumption and trade in the higher income countries.

- In lower income countries, the tendency to tax producers is typically rooted in the desire to provide low-cost wage goods (food staples) to support industrial development, and to assure political stability among poor and increasingly urban populations. Gains in public revenue from export taxes are also a factor. Pressures for policy change include the strengthening political voice of farmers who face deteriorating terms of trade, and the need to strengthen incentives so that farm output can keep pace with overall economic growth. Control of the budgetary cost of consumer subsidies is also a growing constraint in some countries. In contrast to the higher income countries, future changes in policy may tend to boost domestic production and slow both consumption and trade.

India

Rip Landes and Kim Hjort

Abstract: India is one of Asia's largest economies and policy reforms are improving prospects for long-term growth. However, gains in domestic production are expected to prevent significant expansion of agricultural import demand in the 1990's. Farm sector reforms could expand Indian farm exports.

Keywords: India, agriculture, supply, demand, policy, trade, wheat, rice, coarse grain, oilseeds and products, animal products, cotton.

Introduction

With a population of 886 million and total economic output of \$327 billion in 1992, India is Asia's second most populated country and third largest economy. Economic growth strengthened significantly during the 1980's, when the real Gross Domestic Product (GDP) growth rate increased from the long-term average of 3.5 percent to more than 5 percent. Imports and exports now total only 14 percent of GDP, making India more closed to trade than any other major Asian economy. But the role of trade has increased since the mid-1980's as a result of faster economic growth, increased need for foreign capital, and measures to deregulate domestic industries and liberalize foreign trade.

Despite faster growth in industrial and services output, agriculture remains the key economic sector, accounting for one-third of GDP and two-thirds of employment. Extensive land and water resources permit cultivation of most crops, and the bovine herd (cattle and water buffalo) is the largest in the world. Farm imports have trended down, and now average about \$1.2 billion annually, consisting primarily of edible oils, pulses, wool, and, periodically, wheat and rice. Farm exports are fairly stable and average near \$2.1 billion, consisting primarily of tea, oilmeals, basmati rice, coffee, cashews, and spices.

Agricultural and food policies are now under increasing pressure for change. Despite success in the key policy objective, providing adequate supplies of food staples at affordable prices, there is concern about the capacity of the farm sector to meet the diverse demands of a rapidly expanding economy. There is concern about the adequacy of existing incentives, investment, and technology in sustaining output growth. Given the concentrated gains in specific crops and regions, there is concern about the adequacy of current policies in tapping production potential, and in reducing poverty and undernutrition.

Economic Trends and Policies

During the 1980's, a period of slow growth in much of the world, growth in India's real GDP accelerated significantly. After averaging about 3.5 percent annually between 1947 and 1980, real GDP growth increased to 5.3 percent during 1980-91. Most sectors, including agriculture, manufacturing, and infrastructure, contributed to higher growth, driven by strong

domestic savings and investment and modest deregulation of the domestic economy. Economic performance also became less vulnerable to weather-induced variations in farm output—the result of more irrigation and the growing share of nonfarm sectors in national income.

Building on the 1980's performance, real GDP growth is projected to average 5 percent during 1993-2000. Sustained high growth is expected to be driven by continued strong domestic savings and investment, as well as more liberalizing reforms of domestic and trade policies. Growth has been sluggish during 1991-1993 as policies seek to reduce unsustainable fiscal and trade deficits, but should strengthen by the mid-1990's. Annual fluctuations in economic growth should also continue to abate. Relatively strong and stable growth would create sustained pressure on food supplies and prices.

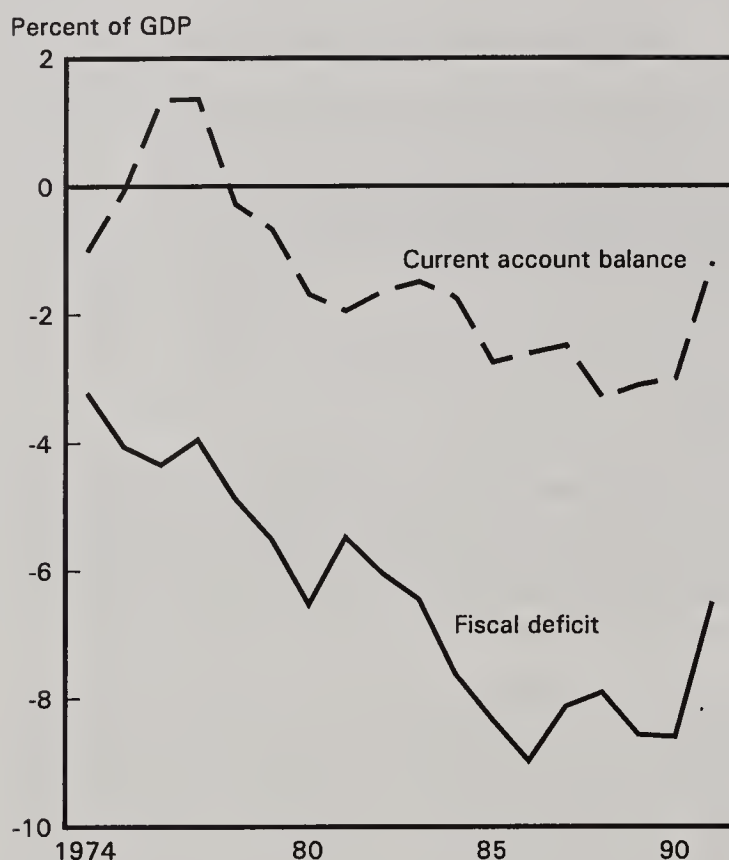
Fiscal and Monetary Trends

The relatively closed nature of the Indian economy reduced its vulnerability to the 1980's slowdown in global trade. However, failure to adjust to weak export earnings and capital inflows did, by the late 1980's, contribute to the same problem of rising fiscal- and balance-of-payments deficits and growing foreign debt that plagued many other countries earlier in the decade (figure E-1). India's problems remain less acute—there has been no decline in incomes, no hyperinflation, and no default on debt. However, large imbalances, and the efforts to reduce them under an International Monetary Fund (IMF) structural adjustment program, will have several implications for the farm sector.

One impact of the deficits has been to create excess liquidity and inflationary pressure through use of domestic bank credit to finance budget shortfalls. Inflation increased from the average of 6-7 percent to more than 10 percent in 1991 and 1992. Price stability is a key economic and political priority, so inflation generally leads to larger imports of food staples to minimize the impact on low-income consumers. Food grain imports are particularly affected because inflation tends to reduce government procurement and increase subsidized offtake—both of which occur at fixed nominal prices.

During the early 1990's, it is likely that the high priority given to restoring price stability will result in tight fiscal and monetary policy. This implies more discipline on budget subsi-

Figure E-1

India: Fiscal and Current Account Balance

Source: Government of India

dies—including agricultural subsidies that are accounting for a growing share of the budget. There are also likely to be more constraints on public investment, which accounts for slightly less than half of total investment. And, because a large share of commercial bank funds are tied up in government securities, private capital may also be more constrained. During the 1980's, growth in domestic investment increased, averaging a relatively high 23 percent of GDP. In the 1990's, private investment will probably have to play an increasingly important role if these rates are to be sustained.

Trade and Trade Policy Developments

India's balance of payments is chronically under pressure, in large part because of a long standing policy bias towards import substitution that has inhibited the development of export-competitive industry. There was a steady trend towards import liberalization in the 1980's aimed at making the large industrial base more competitive, but insufficient export growth led to increasingly unmanageable trade deficits and sharply rising foreign debt by the early 1990's. These developments have forced more fundamental and rapid changes in the trade regime during the 1990's with IMF support. While trade in many items will continue to be regulated in the short term, the necessity for significant liberalization of imports and promotion of exports seems to be firmly established.

Trade policy changes already made include reduced quantitative restrictions on trade, and a sharp devaluation of the rupee—the first since 1966. Assuming continued IMF support, further reductions in quantitative trade restrictions and steady depreciation of the rupee are likely, which will improve farm export incentives. Significant steps have also been taken

to increase the historically small role of foreign capital and direct investment in the economy. More access to foreign capital is increasingly important for sustaining investment because of the high rates of domestic savings and investment already achieved.

The direct impact of trade liberalization on agriculture is expected to be small, but indirect effects may be significant. Liberalization measures are expected to focus on the industrial sector, where protection is relatively high and there is a pressing need to increase efficiency and competitiveness. Agriculture, on the other hand, tends to be taxed rather than protected by current policies and, so far, has not been the focus of reform efforts. In fact, the higher prices for food staples and agricultural raw materials that would accompany a broad liberalization of agriculture may tend to worsen short-term adjustment problems by raising factor costs for industry, as well as raising food prices for low income consumers. However, the farm sector should gain indirectly, perhaps significantly, as declining industrial protection reduces the substantial domestic terms-of-trade bias against agriculture.

Trade in major farm commodities, including cereals, cotton, oilseeds, and oils, will likely continue under government control. As a result, import and export decisions will remain dependent primarily on domestic supply, demand, and price conditions. Transmission of short term world price fluctuations into domestic markets will remain negligible, although price policy will likely continue to heed longer-term trends in world prices. It is unlikely that the external position will improve enough during the 1990's to permit significant liberalization of imports of food or other goods categorized as nonessential. However, imports of foods deemed essential will continue to have priority funding.

Agricultural Trends and Policies

India's extensive land and water resources allow it to rank among the world's largest producers of commodities, including rice, wheat, sorghum, millet, corn, pulses, peanuts, rapeseed, and cotton. Production of livestock products remains relatively low, but dairy and poultry output have been expanding rapidly. While not matching the fast growth of some other Asian countries, the 3.7 percent annual growth in farm output in the 1980's was relatively strong—and represented an improvement over the 1960's and 1970's (table E-1).

Despite considerable success in expanding output, increasing self-sufficiency, and maintaining food price stability, there is growing pressure for significant changes in agricultural policy. Key problems are inadequate output growth in some sectors and regions, inability to sustain growing public subsidy and investment outlays, and questions about the capacity of research and other institutions to support an increasingly diverse sector. The case for boosting performance in lagging regions and secondary crops is made both on efficiency and equity grounds. Marginal returns to investment may be highest in lagging regions, which also contain the bulk of the population still in poverty. Policy prescriptions focus on redirection of agricultural price and trade policy to boost producer incentives, reduce subsidy outlays in favor of investment, and strengthen and broaden institutional support.

Table E-1. India: Trends in farm output

	1960's	1970's	1980's
Growth rates			
Rice	2.0	2.4	3.4
Wheat	8.0	4.3	4.2
Corn	6.2	-.7	2.7
Sorghum	-1.9	2.5	1.4
Millet	9.3	-4.0	2.7
Pulses	-.7	-1.1	2.8
Food Grains	2.8	1.8	3.1
Peanuts	2.4	-2.0	4.3
Rapeseed	3.6	1.4	8.5
Oilseeds	3.2	-.2	7.0
Sugarcane	1.4	2.0	4.5
Cotton	-1.5	3.9	3.4
Milk 1/		2.1	5.5
Eggs 1/		6.0	7.1

Source: Calculated from Government of India data.

1/ Growth rates for 1950-1980

Producer Price Policy

Major policies affecting producer prices are a system of support prices, and State controls on imports and exports, including State trading monopolies, trade licensing, or quotas. In the presence of trade controls, both support and open market prices of most commodities generally range below import parity (figure E-2). During the 1980's, the effect of these trade controls on output prices tended to more than offset positive transfers due to various input subsidies. The result is net economic taxation of major crop production, and of the sector as a whole, which showed no signs of declining during the 1980's (figure E-3).

The overall effect of these policies is to reduce production, but the incidence and impact vary by region and commodity. Taxation is low in regions, particularly in northern India, where commercial production, public investment, and use of subsidized inputs is highest. On the other hand, taxation is relatively high in regions, particularly rainfed areas, where coarse grains and pulses are cultivated and production, investment, and input use are more marginal. In contrast to other crops, oilseeds received positive total support during the 1980's, reflecting the significance of import substitution efforts for edible oils. Edible oil imports have declined, but the policy has promoted the cultivation of oilseeds in place of crops, particularly cereals, that are produced more efficiently (table E-2).

Figure E-2

India: Producer Subsidy Equivalents by Major Commodity (1982-90 Average)

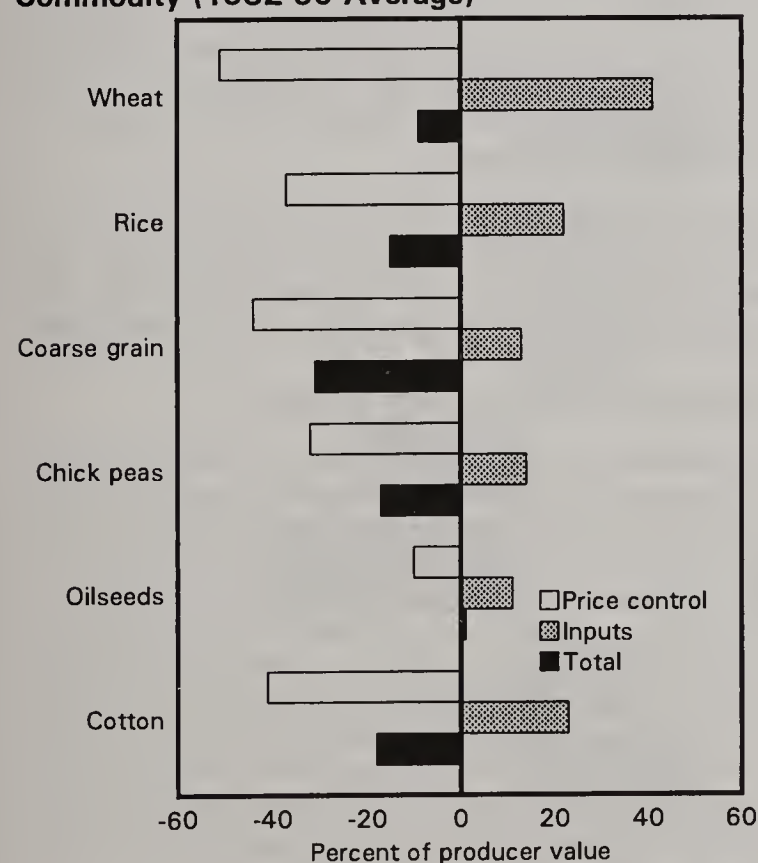
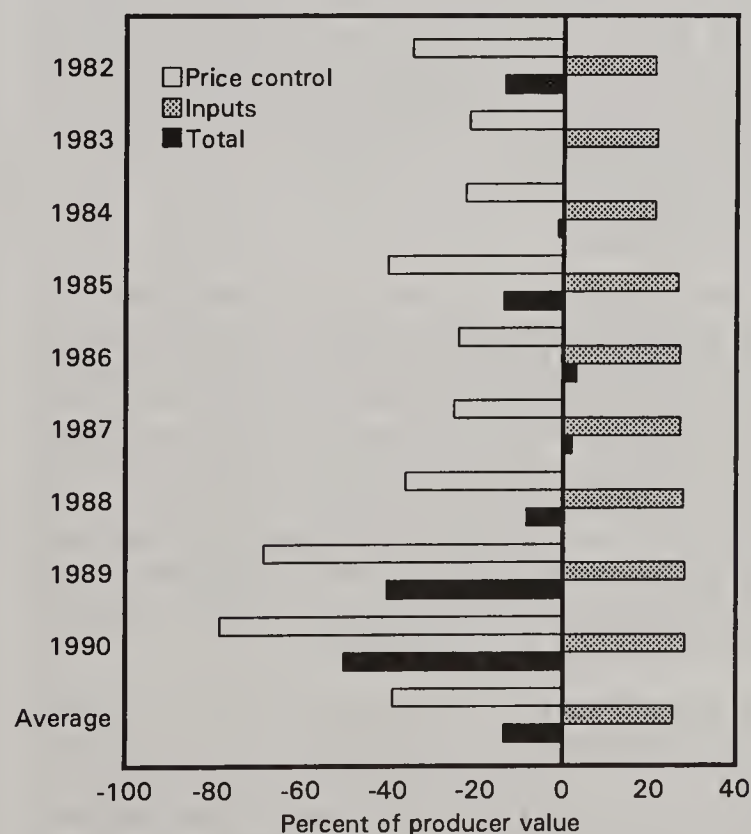


Figure E-3

India: Trends in Producer Subsidy Equivalents 1/



1/ Aggregate for rice, wheat, corn, sorghum, chickpea, cotton, soybeans, peanuts and rapeseed

Table E-2. India: Composition of production growth for major crops

	1960's	1970's	1980's
Growth rates			
Cereals			
Area	1.0	.2	-.1
Yield	2.4	1.9	3.3
Production	3.4	2.1	3.2
Pulses			
Area	-.4	-.1	.8
Yield	-.3	-1.0	2.0
Production	-.7	-1.1	2.8
Oilseeds			
Area	1.9	.6	3.2
Yield	1.3	-.8	3.8
Production	3.2	-.2	7.0

Source: Calculated from Government of India data.

During the 1990's, there will likely be more emphasis on increasing producer-price incentives for commodities having low domestic prices relative to world prices, particularly food grains and cotton. As has been the case in the last few years, incentives will be boosted by adjustments in support prices, elimination of government procurement practices that suppress farm prices, and more liberal policies towards exporting surpluses. The goals are to ensure that output keeps pace with strengthening demand, to stimulate growth in lagging regions, and to appease politically important producer interests. However, over the long term, reduced support for protected crops, particularly oilseeds, is expected because of success in reducing imports and concern with distortions in resource allocation.

Input Subsidies

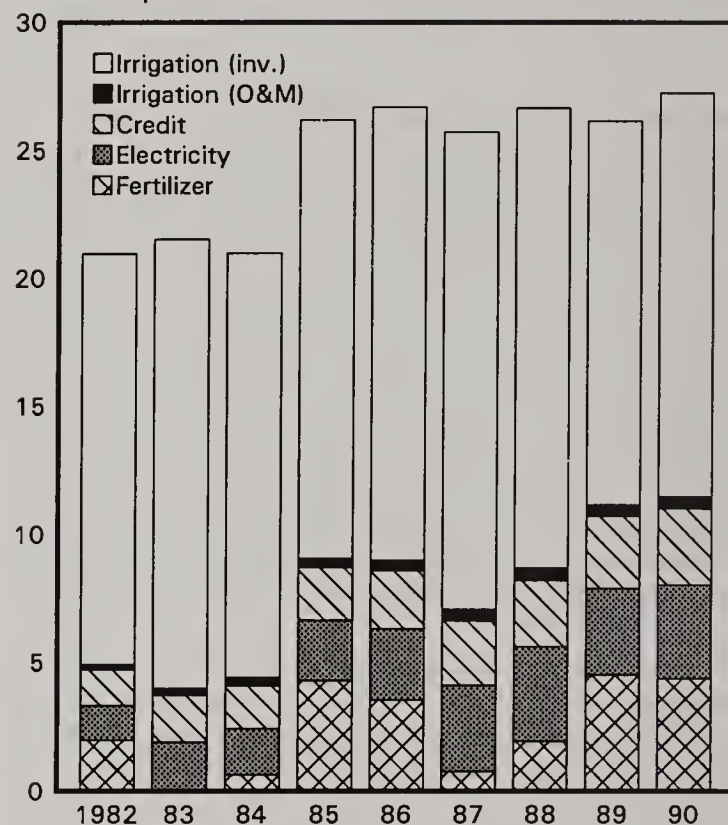
Government interventions in farm inputs include price subsidies on fertilizer, electricity, credit, and surface irrigation water, as well as substantial infrastructure investment, most notably on surface irrigation systems. Policies have emphasized investment rather than current subsidies on variable inputs. Irrigation investment is, by far, the major intervention (figure E-4). Public outlays for input interventions are a growing problem within the government budget and are likely to be cut during the 1990's. Current subsidies will face the most cuts, but there will also be pressure to generate a larger share of investment in the private sector.

Subsidies on fertilizer, the most significant of the variable input subsidies, are slated for significant cuts during 1993-96. Cuts in subsidies on irrigation water and credit are administratively difficult, and are expected to occur more gradually. High priority will likely be given to maintaining irrigation investment, but some cutbacks are already in evidence—along with more emphasis on enhancing the efficiency of existing systems rather than starting new ones.

Figure E-4

India: Trends in Input Subsidies for Major Commodities

Percent of producer value



Source: Government of India

While cuts in irrigation development would likely have a significant impact on longer-term growth in farm output, cuts in variable input subsidies are expected to have relatively small long-term effects. Reductions in input subsidies are likely to be accompanied by hikes in support prices, as well as better targeting to smaller farmers where they are most effective in boosting supply.

Public outlays in support of agricultural research and extension are expected to be maintained and, eventually, strengthened. Increasing emphasis will be placed on crops other than wheat and rice, particularly oilseeds, pulses, and coarse grains.

Consumer Policy and Food Demand

The principal mechanisms for maintaining food price stability are trade policies that insulate domestic prices from world prices, and the Public Distribution System (PDS). The PDS supplies cereals, edible oils, and other basic commodities to urban consumers at below-market prices. In the case of cereals, procurement of domestic production and subsidized consumer sales occur at annually adjusted procurement and issue prices, with periodic imports and/or resale of PDS wheat to the open market to maintain public buffer stocks at desired levels. In the case of oils, only imported oils are distributed. In both cases, PDS operations are small relative to open market transactions, but do serve to reduce seasonal and annual variability in consumer prices.

For cereals, trade and PDS policies result in significant consumer subsidies, with trade policies accounting for the bulk

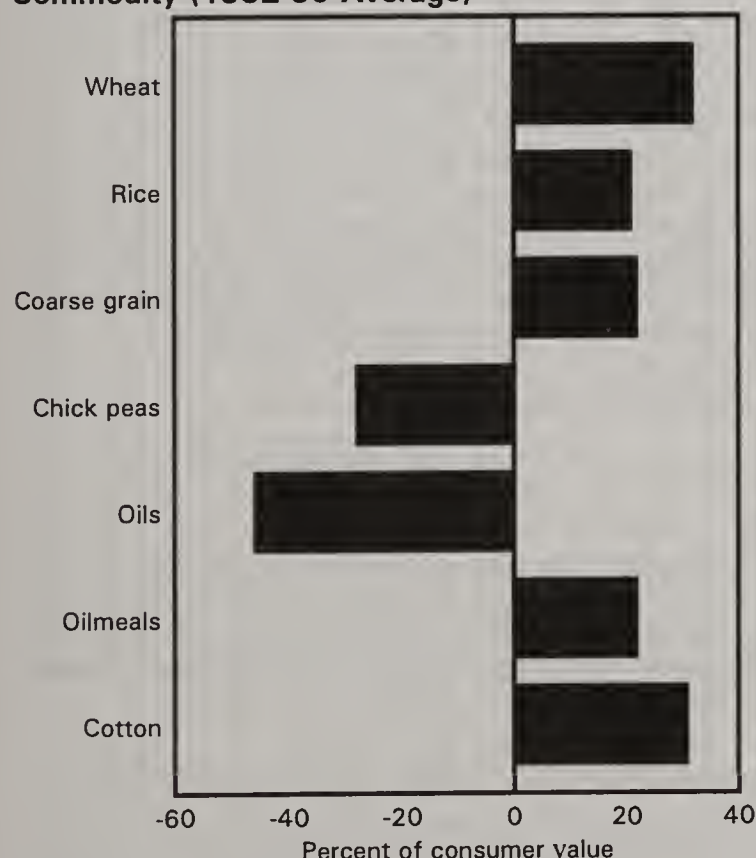
of the transfer (figure E-5). During the 1990's, these policies are likely to face several pressures that will affect cereal trade:

- As long as inflationary pressure remains strong, there will be a tendency for deficits in the PDS that may boost cereal imports. With rising prices, producers are less willing to sell cereals to the government at fixed prices, while consumers demand more cereals at fixed prices. To escape this problem, the government will have to control inflation or make relatively large hikes in procurement and/or issue prices.
- The expected hikes in producer incentives during the 1990's will require either higher consumer prices, increases in the volume and cost of subsidized distribution to consumers, or both. If political concerns prevent increases in issue prices, then rising demand for subsidized cereals through the PDS may boost import needs. However, cereal subsidies are already a large part of the government budget and will face severe pressure for reduction. To balance consumer and budget concerns, the government will likely try to reduce the PDS, but better target subsidies to the poorest consumers.

In contrast to cereals, consumers of edible oils have been taxed by trade and price policies that maintain high domestic prices to promote import substitution. Sales of imported oils through the PDS have not represented an economic or budget subsidy because issue prices are well above import prices and quantities distributed are now relatively small.

Figure E-5

India: Consumer Subsidy Equivalents by Major Commodity (1982-90 Average)



The distortion of consumer edible oil prices has been sharply higher than oilseed producer prices, indicating that a large share of the tax paid by consumers has not been effectively transferred to producers as a price incentive to increase production. This problem, together with concerns about promoting relatively inefficient production of oilseeds in place of cereals, is the source of increasing pressure to reduce price distortions in the edible oil market. It is expected that trade and price policies will gradually reduce the gap between domestic and world prices of oils, but maintain significant consumer taxation.

Consumers of domestically produced cotton, including mills and manufacturers that produce for both domestic and export markets, have been subsidized by trade controls that maintain domestic raw cotton prices significantly below world prices. This policy taxes raw cotton production, but has been justified by the textile sector's status as the largest single industrial employer and source of export earnings. Textile exports expanded rapidly in the late 1980's, and future policies are likely to be more aggressive in promoting growth—to the extent feasible given the quota constraints of the international Multi-Fiber Agreement. This implies moderate hikes in nominal producer prices (constant real prices) of raw cotton, and continued management of raw cotton exports to assure adequate supplies and favorable prices for domestic mills.

Land and Infrastructure

Although there is little scope for increasing net cropped area, gains in cropping intensity have driven continued growth in gross cropped area. Cropping intensity has increased because of expansion of irrigated area, development of short-duration cultivars, mechanization, and price incentives. Irrigation has probably been the key factor, with strong growth in area stemming from heavy public outlays for surface irrigation systems and private investment in wells and pumps for groundwater irrigation (figure E-6). Irrigation has also been a fundamental source of yield improvement, particularly in wheat, rice, cotton, and other crops for which high yielding varieties are available.

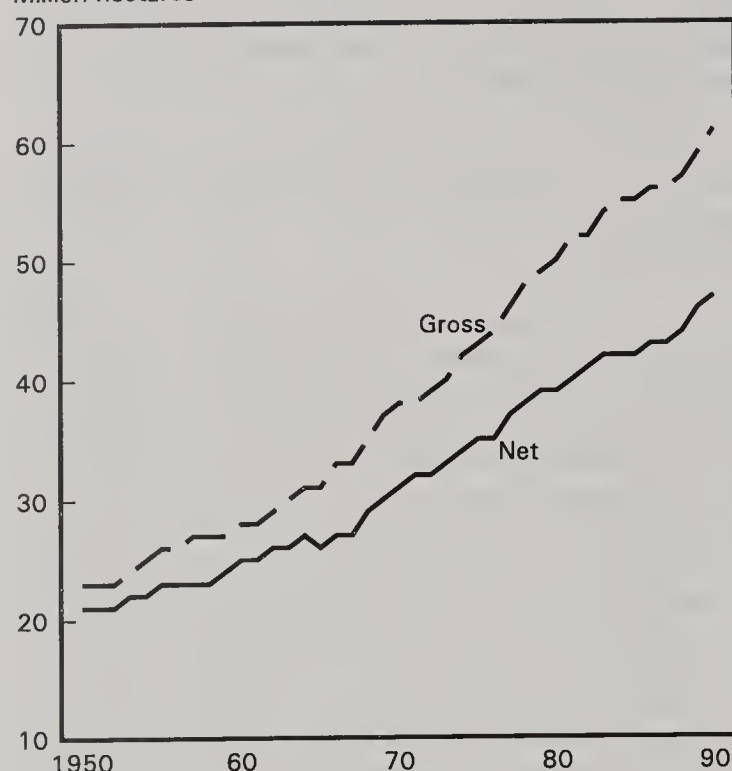
For the 1990's, gains in area and productivity will remain linked to sustained public and private investment, particularly in irrigation. Although 74 million hectares of irrigated area is already the largest in the world, the potential for irrigation is still higher—about 110 million hectares. The key questions are whether sufficient rates of investment can be sustained and whether existing water supplies can be used more efficiently. In the past, capital formation in agriculture has been correlated with the terms of trade faced by the sector—and there was a noticeable decline in both capital formation and the terms of trade in the 1980's (table E-3).

Agriculture and irrigation are expected to remain priority sectors for public investment and, if the terms of trade are improved, will also likely continue to attract substantial private capital. During the early 1990's, public irrigation investment will focus on completion of existing projects and improving water use efficiency. While the overall capital availability is likely to be constrained, agricultural investment normally has relatively high returns and should fare better

Figure E-6

India: Trends in Irrigated Area 1/

Million hectares



Source: Government of India

1/ Gross includes area on which more than one irrigated crop was grown during the crop year

Table E-3. India: Trends in capital formation and agriculture's terms of trade

Period	Growth in real gross capital formation		Agriculture's average barter terms of trade
	Total	Agriculture	
	Growth rates		Percent
1950-1960	7.4	2.8	85
1969-1970	3.5	5.2	97
1970-1980	5.5	5.4	95
1980-1988	6.4	.3	86

Source: Calculated from Government of India data.

than other sectors. However, to the extent that past and future public and private investment in agriculture is affected by shortages of capital, future growth in farm output may be placed at risk.

Issues Affecting Agricultural Trade in the 1990's

Key issues in the outlook for India's agricultural sector in the 1990's are economic performance and its influence on demand, developments in agricultural price policy, and the adequacy of investment. While it is possible to make assumptions based on past trends, it is clear that India's economic

and agricultural development has reached a point where future developments may not reflect past trends. The base projections incorporate the following assumptions and risks regarding these issues. The sensitivity of the base projections to these assumptions are then analyzed in alternative scenarios.

Income Growth

Projected annual growth of real GDP of 5 percent, while above long-term trends, is slightly below recent performance. Sustaining a moderate pace of structural reforms is expected to allow a continuation of relatively strong growth. However, if political conditions and donor support permit a more aggressive reform program, India's rich resource endowment and broad industrial base could generate significantly faster growth. On the other hand, should political problems curtail the reform program, growth could revert to the long-term pace of 3-4 percent annually.

Agricultural Price Policy

While significant market-oriented reforms have already occurred in the industrial sector, changes in agricultural and food policy are expected to remain modest and gradual. In the base scenario, farm incentives are assumed to strengthen as producer prices continue to rise relative to input costs. This is the most likely scenario because more rapid reform would, in many cases, imply shocks to the existing price structure or an ability to cushion impacts on low-income consumers that would be politically and administratively difficult to achieve.

However, given the substantial policy intervention in agriculture at present, there is broad scope for the government to affect future trade patterns through policy change. Budget austerity and donor pressure could lead to more significant farm policy reform. One scenario would be sharper reductions in the consumer subsidy by narrowing the gap between cereal support prices and subsidized consumer issue prices. Another possibility would be to more aggressively promote cereal production—and rural incomes—by allowing domestic producer and consumer prices to rise closer to world prices. In the oilseed sector, the government could opt to reduce the inefficiencies of current import substitution policies even more rapidly than is assumed in the base scenario.

Agricultural Investment

In the base scenario, it is assumed that agricultural investment, as well as resulting gains in productivity, are sustained at rates slightly below past trends. This assumption reflects the apparent slowdown in farm investment that occurred in the 1980's, and a fairly tight domestic investment climate—at least through the mid-1990's. On the other hand, the projected improvement in the terms of trade for agriculture could stimulate more rapid growth in private investment.

Agricultural and Trade Prospects to 2000

The base projections, summarized in tables E-4 to E-6, do not indicate any fundamental changes in India's trading pattern for grains, oilseeds and products, or cotton. Food grain imports are projected to consist only of relatively small food

Table E-4. India: Base projections for grains

				Growth rates	
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			

	-----Million tons-----			---Percent---	
Wheat					
Area (Mil. ha)	22.36	23.86	25.16	.7	.5
Yield (Tons/ha)	1.55	2.21	2.95	3.6	2.9
Production	34.55	52.83	74.12	4.3	3.4
Net imports	.50	-.17	.13	N/A	N/A
Consumption	35.56	52.82	73.85	4.0	3.4
Per cap.(Kg)	51.35	61.95	72.54	1.9	1.6
Rice					
Area (Mil. ha)	40.09	41.95	44.36	.5	.6
Yield (Tons/ha)	1.24	1.74	2.17	3.4	2.2
Production	49.74	73.05	96.32	3.9	2.8
Net exports	.64	.46	.70	-3.3	4.4
Coarse rice	N/A	.01	.00	N/A	-100.0
Basmati rice	N/A	.45	.70	N/A	4.7
Consumption	51.10	72.93	95.00	3.6	2.7
Per cap.(Kg)	73.72	85.53	93.31	1.5	.9
Coarse grains					
Area (Mil. ha)	41.71	36.56	34.11	-1.3	-.7
Yield (Tons/ha)	.70	.88	.96	2.4	.9
Production	29.12	32.20	32.60	1.0	.1
Net exports	.03	.00	.00	-100.0	N/A
Consumption	29.45	32.30	32.61	.9	.1
Food	27.80	28.88	23.04	.4	-2.2
Per cap.(Kg)	40.13	33.92	23.14	-1.7	-3.8
Feed	1.65	3.41	6.45	7.5	6.6

aid shipments by 2000, as strengthening aggregate demand is offset by higher producer incentives and continued advances in yields. Edible oil imports are projected higher by the late 1990's as current producer subsidies and consumer taxes are eased, but remain well below past highs. The cotton sector is expected to be dynamic, with expanding exports of raw cotton and, particularly, textiles.

Wheat

Both administered and open market prices of wheat are projected to strengthen moderately in the 1990's, as the government seeks to improve producer incentives and curb budget subsidies. However, domestic prices are expected to remain below world prices and insulated from short-term world price movements. Even with firmer domestic prices, growth in wheat production is projected to slow. Area will continue to expand, although at a slower pace, because of continued growth in irrigated area, higher cropping intensity, and declining incentives for shifting area towards rapeseed and other crops.

Increasingly, production gains will stem from yield growth, which is projected to remain strong as improvements in irrigation and input use increases the potential of existing varieties in many regions. Sharp declines in fertilizer subsidies expected during the early 1990's are assumed to be offset by higher output prices, and have a only very limited impact on productivity.

As in the case of production, growth in wheat demand is projected to slow, but remain relatively strong. Slowed growth is expected to be caused by several factors. First, consistent with behavior in other developing countries, income elasticities of demand for both wheat and rice are likely to decline as per capita incomes rise and poverty is reduced. Second, as noted above, consumer prices are projected to strengthen moderately because of higher producer prices and gradual reductions in consumer budget subsidies for cereals. Third, PDS consumers will continue to prefer rice to wheat, leading to a reduction in per capita wheat issues. Finally, further gains in rice production will continue to reduce demand for domestic and imported wheat to meet shortfalls in rice supplies.

The projections indicate that the recent surge in wheat imports is likely to be temporary, stemming from inflationary pressure and failure to adequately adjust administered prices, and not an emerging imbalance between supply and demand. On average, imports are projected to be limited to minimal food aid receipts. However, sporadic commercial trading is also likely to continue, with imports associated with poor monsoons that create deficits in the PDS, and exports with several years of good weather that create stock surpluses.

Rice

A modest strengthening of administered and open market prices is also expected for rice, although prices are likely to remain more variable because of fluctuations in weather. While rice area will continue to expand slowly—driven by price incentives and gains in irrigation and cropping intensity—an improvement in yields is expected to be the main factor in production gains. In comparison to wheat, there is significantly more scope for boosting rice yields through adoption of improved varieties and cultural practices, particularly in eastern India.

As with wheat, the impact of stronger and more stable income growth on rice demand is expected to be dampened by a gradual decline in the income elasticity of demand, as well as a moderate strengthening of prices. With the base price and income scenarios, the projections indicate negligible average levels of coarse rice imports during the 1990's, accompanied by steady, slow growth in highly profitable exports of high-quality basmati rice. Basmati rice is traditionally sold in expanding markets in the Middle East, and exports received a strong stimulus from the 1991 devaluation of the rupee.

Because of weather, the pattern of coarse rice trade is likely to remain erratic, including periodic imports and exports. However, coarse rice import demand is projected to trend

down, driven by rising domestic supplies and a continued preference for imports of lower-priced wheat to meet production shortfalls.

Coarse Grains

Historically, domestic coarse grain prices have been weak relative to wheat and rice, reflecting low demand for both food and feed uses. Rising feed demand is expected to strengthen prices and slow the long-term decline in coarse grain area during the 1990's, but area is still projected to fall. However, the decline in area is likely to be offset by improved yields, resulting in slightly positive growth in output in the 1990's. Projected yield gains are based on stronger prices and initiatives to improve dryland farming practices.

The bulk of coarse grain supply is consumed as food, primarily by very low income consumers who are gradually shifting toward wheat and rice as their incomes rise. In the 1990's, a continued decline in per capita food use of coarse grains is expected to be partially offset by growth in feed demand of 6-7 percent annually. Information on current feed use in India is very poor, but available data suggest that feed use is a small share of total supply. Thus, even with rapid growth in demand for coarse grain in poultry and dairy rations, gains in feed use are unlikely to require imports. Additional factors weighing against feed imports, at least during the projection period, are current trade restrictions, and the substantial scope for allowing domestic prices to rise before reaching import parity.

Oilseeds and Products

During the 1990's, domestic prices for oilseeds and, particularly, edible oils are expected to fall relative to other commodities as the government gradually retreats from the aggressive import substitution policies of the 1980's. With this change, growth in oilseed production is projected to slow from the pace of the late 1980's as less area is shifted from other crops. Area planted to peanuts, traditionally the dominant oilseed, did not respond to higher prices in the 1980's and is expected to grow little in the 1990's. Soybean, rapeseed, and sunflower accounted for most area growth in the 1980's, but competition with other crops is expected to curtail future area expansion—except for sunflower, which should become increasingly popular in multiple cropping patterns.

Yield gains are also projected to slow relative to the 1980's. Improvements in research, extension, and other institutional support for oilseed producers are expected to partially offset the adverse effects of weaker output prices on technology adoption. As a result of expected developments in area and yield, growth in oilseed production is expected to slow from the late 1980's, but remain above the long-term trend.

Trade in oilseeds is likely to remain negligible. High domestic prices are expected to continue to restrict exports to small amounts of confectionery peanuts. Also, crushing of imported oilseeds is expected to remain unprofitable, primarily because of the large domestic surplus of oilmeals, which drives down local oilmeal prices and potential crushing returns.

Table E-5. India: Base projections for oilseeds and products

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates	
				1980-90	1990-00
	-----Million tons-----			---Percent---	
Total oilseeds					
Area (Mil. ha)	21.46	26.80	32.03	2.2	1.8
Yield (Tons/ha)	.56	.77	.92	3.3	1.8
Production	12.02	20.69	29.42	5.6	3.6
Net exports	.03	.03	.04	-1.7	4.5
Consumption	11.95	20.66	29.38	5.6	3.6
Soybeans					
Area (Mil. ha)	.47	2.41	3.81	17.7	4.7
Yield (Tons/ha)	.92	.89	1.04	-.3	1.6
Production	.42	2.14	3.97	17.7	6.4
Net exports	.00	.00	.00	.0	.0
Consumption	.42	2.14	3.97	17.7	6.4
Total meals					
Production	4.66	9.28	14.09	7.1	4.3
Net exports	.92	2.17	3.87	9.0	5.9
Consumption	3.74	7.11	10.22	6.6	3.7
Per cap.(Kg)	5.39	8.33	10.04	4.4	1.9
Soymeal					
Production	.29	1.53	2.70	18.1	5.8
Net exports	.12	1.19	1.88	25.6	4.7
Consumption	.17	.34	.83	7.3	9.2
Per cap.(Kg)	.25	.40	.77	4.8	6.8
Total oils					
Production	2.62	4.71	6.95	6.0	4.0
Net imports	1.21	.42	.52	-10.1	2.2
Consumption	3.86	5.18	7.46	3.0	3.7
Per cap.(Kg)	5.58	6.08	7.33	.9	1.9
Soy oil					
Production	.07	.34	.61	17.9	5.9
Net imports	.58	.04	.03	-24.0	-1.8
Consumption	.65	.39	.64	-5.0	5.1
Per cap.(Kg)	.94	.45	.63	-7.1	3.4

Edible Oils. It is expected that virtually all oilseed production will continue to be crushed domestically, so growth in edible oil production will track projected domestic oilseed output. Growth in edible oil demand, however, is likely to accelerate because of gains in per capita income and a gradual decline in real prices as import substitution policies are relaxed. Even with oil imports regulated by State trading and high internal

prices, imports are projected to rise by the mid-1990's—but remain well below records.

The projections of oil demand are more sensitive to the assumed policy and price scenarios than supply projections, primarily because past policies have introduced more distortion of oil prices than oilseed prices. Maintenance of the current level of consumer taxation—perhaps due to balance-of-payment constraints—could prevent any growth in future imports, while more rapid reforms could lead to significantly larger imports.

In any case, it is expected that future edible oil imports will continue to favor palm oil because of its relatively low price and because the PDS—which markets imports as pure cooking oil—is likely to remain the sole channel for imported oils. Soybean oil imports are projected to remain small because soybean oil lacks general acceptance as a pure oil, and import of crude oils for use in hydrogenated oil production is expected to remain banned. Unless relative prices change significantly, the composition of future imports is assumed to reflect the current pattern: 86 percent palm oil, 8 percent rapeseed oil, and 6 percent soybean oil.

Oilmeals. The domestic market for oilmeal is traditionally characterized by large surpluses and low prices relative to world markets. This condition is driven by weak effective demand for feeds because of low incomes and dietary preferences, the poor quality of a large share of domestic meal supply and, until the mid-1980's, restrictions on exports. The relatively fast growth of oilseed production in the 1980's, combined with the export incentive created by the 1991 devaluation, boosted exports of soybean, rapeseed, peanut, and other meals to an average of 2.2 million tons during 1989-91.

During the 1990's, demand for meals is projected to grow more rapidly in response to rising incomes and sustained high growth in poultry and egg output. Meal exports are projected to continue expanding, but growth is projected to slow because of increasing domestic demand and somewhat slower growth in oilseed and meal production. Although domestic oilseed prices will likely remain high by world standards, meal exports should remain highly price-competitive because of the relatively high price processors receive for oil in the domestic market. Meal exports are projected at 3.9 million tons in 2000, including 1.9 million tons of soybean meal.

Cotton

Domestic prices of cotton are projected to strengthen compared with a declining historical trend, but remain well below parity with world market prices. Supply of low-priced cotton to the textile processing and export sector is expected to remain the top priority. However, in the interest of stimulating raw cotton output for the growing textile sector, the government is expected to improve price incentives—including elimination of monopoly procurement practices that impose a tax on producers in some areas.

Based on this price outlook and a surge in the late 1980's, cotton area is projected to expand at above the long term trend during the 1980's. Cotton yields are also expected to continue

Table E-6. India: Base projections for cotton

	1979-1981 avg.	1989-1991 avg.	2000	Growth rates -----	
				1980-90	1992-00
	-----Million tons-----			---Percent---	
Cotton					
Area (Mil. ha)	8.00	7.47	8.00	-.7	.7
Yield (Tons/ha)	.17	.28	.37	4.9	2.8
Production	1.37	2.10	2.94	4.4	3.4
Net exports	.09	.14	.12	4.6	-1.5
Consumption	1.29	1.91	2.81	4.0	3.9

rising, but remain well below potential and those in neighboring Pakistan. India's yields are unlikely to match Pakistan's because a smaller share of the crop is produced on irrigated land. However, higher prices could stimulate stronger yield growth through adoption of improved varieties and cultivation practices.

The projections indicate that mill use to meet domestic textile demand will continue to grow at the same rate as in the 1980's. However, growth in mill use to meet export demand for yarns and textiles, which expanded rapidly in the 1980's, is projected to slow. This outlook assumes that rapid growth in textile and yarn exports will not be sustainable because of constraints imposed by importing countries under the Multi-Fiber Agreement. India is a low-cost producer of both raw cotton and textiles and, in this base scenario, raw cotton exports decline slowly during the 1990's as textile exports expand. However, if the policies of textile importing countries are restrictive, raw cotton exports could expand.

Animal Products

Available data on livestock product production and consumer prices suggest rapid growth in domestic supply and use during the 1980's. Milk is the major animal product produced and consumed, and mutton is the major meat. Milk, poultry meat, and egg output appear to be undergoing the most rapid growth, with production increasingly commercialized. Poultry meat production and use grew roughly 13 percent annually during the 1980's, egg output about 7 percent, and milk output about 6 percent. Beef and pork production is growing relatively slowly because of more limited consumer acceptance.

Data to evaluate feed demand implications of expanding animal product output are poor. Expansion of milk, egg, and poultry production probably account for most commercial feed demand, while maintenance rations for draught animals probably account for most noncommercial feed use. Beef, pork, and mutton production depends primarily on scavenged feeds, forage, and grazing, and therefore is not included in the feed demand analysis.

Milk, poultry meat, and eggs are expected to continue to account for the bulk of growth in animal product production and use, and for most growth in feed demand in the 1990's.

Table E-7. India: Base projections for animal products

	Growth rates				
	1979-1981	1989-1991	2000	1980-90	1992-00
	avg.	avg.			
	-----Million tons-----			---Percent---	
Milk					
Production	30.57	53.00	75.36	5.7	3.6
Per cap.(Kg)	44.14	62.15	74.02	3.5	1.8
Poultry meat					
Production	.10	.33	.64	12.6	6.9
Per cap.(Kg)	.14	.38	.63	10.5	5.2
Eggs					
Production (Mil.)	11.80	23.14	39.21	7.0	5.4
Per cap.(Kg)	17.00	27.11	38.83	4.8	3.7

Poultry meat is projected to expand at an annual rate of 7 percent, eggs at 5 percent, and milk at 4 percent (table E-7). Production growth will continue to be stimulated by rising demand and prices, but it is unlikely that the rapid rates of the 1980's—when expansion was from a much smaller base—can be sustained. Currently, trade in dairy, poultry, and eggs is negligible and, despite low domestic feed costs, there is no evidence for significant future exports.

Projected growth in animal products is expected to generate roughly a 7-percent annual increase in grain feed demand and 4 percent in oilmeal demand. Alternative assumptions on growth in animal product demand and supply result in correspondingly higher or lower projections of feed demand. However, because available data suggest that feed use accounts for a very small share of coarse grain and oilmeal supply, even significantly faster growth in feed demand is unlikely to generate significant coarse grain imports or reduce oilmeal exports.

Impacts of Higher Income Growth

While the base projections assume 5 percent annual growth in real income, India's future rate of economic growth is uncertain. Future economic performance hinges on both the vagaries of global economic developments, and on the pace and extent of structural economic reforms. To evaluate the sensitivity of the projections to higher income growth, alternative projections were made assuming an additional 1 percent per year in real income growth.

In addition to the impact of incomes on food demand, the framework used for the India projections attempts to account for other key effects of economic growth. First, agricultural price policy in India has, historically, been responsive to changes in aggregate demand and open market prices. Some of these linkages are incorporated in the model, leading to adjustments in domestic producer and consumer prices as incomes rise. Second, income growth can be expected to link

to investment in agriculture, with higher growth leading to increased investment in such areas as irrigation and research and extension activities.

The results of the high income scenario are shown in table E-8. Although stronger growth leads to higher consumption of most commodities, trade effects are limited to significantly higher edible oil imports and lower exports of cotton and oilmeals.

Higher income growth has little impact on the base projections for wheat and rice trade, primarily because of adjustments in government distribution and price policy. For wheat, based on past policy behavior, the response to strengthening demand and pressure on government stocks is likely to include cut-backs in government sales, higher support and distribution prices, and higher open market prices. In this case, wheat imports remain negligible in 2000, but open-market wheat prices are 6 percent higher than in the base scenario.

For rice, consumption and trade effects of higher incomes are also reduced by expected price adjustments. However, while coarse rice imports remain negligible in 2000, the results do lead to average annual rice imports of 235,000 tons during 1993-99. In contrast to wheat, domestic price and supply adjustments do not occur quickly enough to prevent imports.

Table E-8. India: Results of high income scenario

	2000		
	Base scenario	High income	Change
	-----Million tons-----		Percent
Net imports			
Wheat	.13	.13	.0
Oils	.52	.91	75.9
Net exports			
Rice	.70	.70	.0
Cotton	.12	.08	-33.3
Oilseeds	.04	.04	.0
Meals	3.87	3.74	-3.3
Production			
Wheat	74.12	74.21	.1
Rice	96.32	96.36	.0
Cotton	2.94	2.95	.0
Oilseeds	29.42	29.43	.0
Meals	14.09	14.10	.0
Oils	6.95	6.95	.0
Consumption			
Wheat	73.85	74.00	.2
Rice	95.00	95.40	.4
Cotton	2.81	2.88	2.8
Oilseeds	29.38	29.39	.0
Meals	10.22	10.36	1.3
Oils	7.46	7.86	5.3

However, even with rice imports, domestic consumer prices in 2000 are about 7 percent higher than the base scenario. Because the analysis does not fully account for government behavior in choosing between imports of wheat and rice, it is possible that all or part of the indicated rice imports would be met through imports of wheat.

In the oilseeds sector, the most significant impact of higher incomes is on edible oil imports. Oil demand in 2000 is 5 percent higher than in the base, while imports are higher by 76 percent. Depending on foreign exchange constraints, it is possible that the government would act to curb import growth by allowing internal prices to rise. However, faced with rising demand and limited supply response in the sector, some increase in imports is likely. Higher income growth also has a measurable, though smaller, impact on consumption and exports of oilmeals—reducing exports in 2000 about 3 percent below the base scenario. Higher domestic demand for, and production of, poultry and eggs generates most of the increase in domestic meal consumption.

Impacts of Alternative Food Grain Price Policies

The base scenario assumes a gradual rise in real support prices for grains, but with domestic prices remaining below world prices. In the context of rising demand and reforms elsewhere in the economy, a more fundamental change to improve food grain producer incentives is possible. To evaluate the potential impact of such a change, an alternative scenario estimates the effects of moderate increases in food grain support and issue prices relative to the base scenario. The wheat procurement price is increased to 76 percent of the border price by 2000 (compared with 71 percent in the base scenario) and the rice procurement price is increased to 72 percent of the border price (64 percent).

The impact of raising domestic prices closer to world prices, shown in table E-9, is significant increases in production and consumption of wheat and rice, and exports of rice. Wheat area and yield respond to higher prices, leading to higher production and government procurement. With accumulating stocks, the government commits more wheat to open market sales, pushing down open market prices and raising overall consumption. By 2000, the results indicate sufficient stocks for a small exportable surplus.

The rice sector impact is more significant because rice prices are now further below world prices than wheat prices—and so must rise more to reach about the same level relative to border prices. Area and yield gains mean nearly a 9 percent increase in production, as well as higher procurement. Similar to wheat, larger stocks are sufficient to boost public distribution and hold down open market prices, leading to higher consumption. In addition, coarse rice import demand is eliminated and a significant exportable surplus of coarse rice would develop by 2000. Basmati rice exports continue to increase, which would result in total net rice exports 211 percent higher than the base in 2000.

Table E-9. India: Results of grain policy reform

	2000		
	Base scenario	Issue and procurement price scenario	Change
	----Million tons----		Percent
Net imports			
Wheat	.13	.04	-68.0
Oils	.52	.60	14.9
Net exports			
Rice	.70	2.19	211.1
Cotton	.12	.15	21.3
Oilseeds	.04	.04	.0
Meals	3.87	3.79	-2.1
Production			
Wheat	74.12	77.24	4.2
Rice	96.32	104.60	8.6
Coarse grains	32.60	33.18	1.8
Cotton	2.94	2.96	.6
Oilseeds	29.42	29.16	-.9
Meals	14.09	13.96	-1.0
Oils	6.95	6.88	-1.0
Consumption			
Wheat	73.85	76.75	3.9
Rice	95.00	102.17	7.5
Coarse grains	32.61	33.18	1.8
Cotton	2.81	2.78	-1.6
Oilseeds	29.38	29.12	-.9
Meals	10.22	10.17	-.5
Oils	7.46	7.47	.1

Because procurement prices for most crops are typically linked to rice and wheat, the scenario also leads to higher coarse grain and cotton support prices—and higher production. Trade effects in coarse grains are nil, but raw cotton exports rise significantly because of the increased production and lower consumption associated with higher support prices. For oilseeds, the scenario raises support prices for grains relative to oilseeds, shifting oilseed area to grains and reducing production of oilseeds, meal, and oil. The impact on meal exports is dampened by a fall in meal demand as higher coarse grain prices reduce animal product output. However, the impact on oil imports is significant, with imports about 15 percent above the base in 2000.

Table E-10. India: Results of oilseed policy reform

	2000		
	Base scenario	Lower procurement price scenario	Change
	----Million tons----		Percent
Net imports			
Wheat	.13	.13	.0
Oils	.52	.81	55.4
Net exports			
Rice	.70	.70	.0
Cotton	.12	.12	3.1
Oilseeds	.04	.04	.0
Meals	3.87	3.34	-13.6
Production			
Wheat	74.12	80.32	8.4
Rice	96.32	96.32	.0
Coarse grains	32.60	33.03	1.3
Cotton	2.94	2.95	.0
Oilseeds	29.42	28.42	-3.4
Meals	14.09	13.51	-4.1
Oils	6.95	6.67	-4.0
Consumption			
Wheat	73.85	79.92	8.2
Rice	95.00	94.95	.0
Coarse grains	32.61	33.04	1.3
Cotton	2.81	2.80	-.3
Oilseeds	29.38	28.38	-3.4
Meals	10.22	10.17	-.5
Oils	7.46	7.47	.1

Impact of Alternative Oilseed Price Policies

For the oilseed sector, the base scenario assumes that support prices will remain roughly constant in real terms, implying a gradual and partial closing of the gap between world prices and relatively high domestic prices. The government could move more aggressively to reduce the economic distortion associated with its current import substitution policy. To help evaluate the impact of such a change, an alternative scenario estimates the effect of reducing oilseed producer prices closer to import parity by 2000, while keeping the current tax on edible oil consumption.

The results of the oilseed price policy reform scenario are shown in table E-10. As would be expected, oilseed production in 2000 is lower, primarily because of reduced area planted. Assuming no oilseed trade, oilseed crush and the output of meal and oil fall. In the case of oil, impacts on consumer prices and demand are minor, but the drop in domestic supply leads to a sharp 55-percent hike in import demand compared with the base scenario. Meal exports fall

about 14 percent compared with the base, and domestic meal demand falls slightly as reduced production raises internal prices.

Oilseed price reform also affects production of other crops, including wheat, coarse grain, and cotton. Wheat output rises significantly as the prices of competing oilseed crops, primarily rapeseed, decline. Impacts on the production of coarse grain and cotton are small relative to wheat, and impact on rice production is found to be negligible.

Potential Impact of Declining Investment

Investment in agriculture seems to have fallen in the 1980's, and may continue to be affected by the fiscal deficits and monetary restraint in the early 1990's. Reduced investment may not be significant, particularly if efficiency is increased. But, because of the critical role of investment in general, and irrigation investment in particular, in past gains, it is important to assess what might happen if investment differs significantly from the base assumption. While the projection framework does not fully account for investment-productivity links, it

Table E-11. India: Results of investment scenarios

	2000				
	Base	Low investment	Change	High investment	Change
	Million tons		Percent	Million tons	Percent
Net imports					
Wheat	.13	1.23	880.8	-.81	-746.4
Oils	.52	.63	22.4	.39	-24.7
Net exports					
Rice	.70	.68	-3.1	1.39	97.6
Cotton	.12	.10	-17.8	.14	19.6
Oilseeds	.04	.04	.0	.04	.0
Meals	3.87	3.37	-13.0	4.44	14.7
Production					
Wheat	74.12	64.10	-13.5	85.56	15.4
Rice	96.32	91.99	-4.5	100.95	4.8
C. grains	32.60	32.52	-.2	32.70	.3
Cotton	2.94	2.91	-1.2	2.98	1.2
Oilseeds	29.42	28.66	-2.6	30.28	2.9
Meals	14.09	13.61	-3.5	14.64	3.9
Oils	6.95	6.82	-1.8	7.09	2.0
Consumption					
Wheat	73.85	65.17	-11.8	84.55	14.5
Rice	95.00	91.10	-4.1	99.30	4.5
C. grains	32.61	32.54	-.2	32.71	.3
Cotton	2.81	2.83	.6	2.79	-.7
Oilseeds	29.38	28.62	-2.6	30.24	2.9
Meals	10.22	10.24	.2	10.21	-.2
Oils	7.46	7.45	-.2	7.48	.2

does help analyze the impact of investment assumptions. In the alternate scenarios, an additional 1 percent annual growth and a 1 percent annual decrease in agricultural investment are analyzed.

The bulk of the investment effects accounted for in the projections framework stems from impacts on irrigated area development and associated changes in cropped area and yields. The most significant trade effects of alternative investment growth paths are found in the wheat, rice, and oil markets (table E-11). In general, a slower pace of investment implies larger net imports of farm commodities, while faster investment significantly reduces net imports.

Slower investment growth leads to significantly higher wheat imports, and increased investment leads to significant potential exports. In both cases, however, adjustments in domestic consumption and prices offset most supply effects. The large impact on wheat relative to other crops stems from the close historical link between irrigation and wheat area and yield. Rice production is more weakly correlated with irrigation than wheat, leading to less significant impacts on rice supply, use, and trade.

Oilseeds, along with coarse grain and cotton, also tend to be less dependent on irrigation than wheat, leading to a smaller impact on production. However, trade effects in the oil sector are significant. Oil imports are 22 percent higher than the base scenario with low investment and 25 percent lower with higher investment, primarily because of impacts on oilseeds area and yields. The size of the cotton surplus also appears sensitive to investment.

Conclusions

The base projections do not indicate any fundamental changes in India's trading pattern for grains, cotton, or oilseeds and products. Grain trade is expected to remain small, with periodic drought-induced imports offset by periodic exports after good monsoons. For wheat and rice, the impact of strengthening aggregate demand is offset by somewhat higher producer incentives and continued advances in yields. For coarse grains, rapid growth in feed demand is offset by declining food use and modest yield gains. Exports of raw cotton, as well as cotton-based textiles, are projected to continue expanding, based on further productivity gains and subject to constraints on textile exports imposed by the MFA. Imports of edible oil are projected to rebound significantly from the relative low of 1988-92, as price and trade policies less aggressively promote import substitution.

While the results summarized above are the expected outcome for India's agricultural markets, the results are sensitive to underlying assumptions on economic growth, price policy,

and investment. In the case of grains, the scenario analyses suggest that, unless investment in agriculture declines, imports will not be needed through the remainder of the decade. Both sectors appear resilient enough to adjust to stronger demand or reduced supply without a return to chronic importing. The analyses also suggest that the foodgrain economy can be more stable with slight upward adjustment in domestic prices that moves them closer to world prices.

Oil imports are the most sensitive to alternative assumptions regarding income growth, price policy, and investment. In all cases, except when growth in investment is increased, oil imports increase by 15 to 75 percent above the base projection. This suggests that the need for oil imports is a long-term chronic condition likely to resurface in the 1990's, unless policies become increasingly distorted or more investment is focused on the sector.

Base projections of cotton and oilmeal trade are least affected by the set of alternate assumptions evaluated. Impacts on production and consumption of both cotton and meal are relatively small, and do not alter India's position as a significant exporter of these goods. Beyond 2000, growth in animal product production and feed demand could reduce oilmeal exports or increase import demand for coarse grain. However, this is not expected to occur within the next 10-15 years.

Based on the analysis, the potential for U.S. agricultural exports to India during the 1990's is likely to remain limited. The United States, as has been the case through most of the 1980's, will remain a competitor for sporadic imports of wheat. Delivered cost and the ability to meet delivery schedules are likely to remain the key factors in selling wheat to India. Although periodic rice imports are also forecast, neighboring low-cost suppliers can be expected to meet Indian demand. Also, despite the outlook for rising imports of edible oil, limited consumer acceptance of soybean oil and stiff price competition from palm and other oils may continue to constrain U.S. sales. Competitive pricing of U.S. soybean oil relative to other suppliers of palm, soybean, and rapeseed oil would appear to be necessary.

The results also show that India will continue to compete with the United States in the cotton and oilmeal markets. In the case of cotton, competition will include exports of raw cotton, as well as exports of yarns and textiles to Asian countries that have been traditional markets for U.S. cotton. India is expected to remain a growing and low-cost supplier of oilmeals, including soybean meal during the 1990's. Although unlikely to compete effectively in large, quality-sensitive markets, India should remain a highly competitive supplier of small shipments to emerging oilmeal markets in Asia and the Middle East.

Diet Change in Asian Countries

Increases in per capita food consumption and changes in dietary composition associated with rising incomes are important factors in projecting food demand in Asian countries. Total caloric intake typically rises with per capita income, leveling off when incomes reach relatively high levels. However, not all countries adhere to identical trends because of cultural differences. A key example is Japan's low caloric intake relative to other high income countries. Still, particularly for the lower income countries of South and Southeast Asia, growth in incomes can be expected to continue to raise per capita food consumption through the 1990's and beyond.

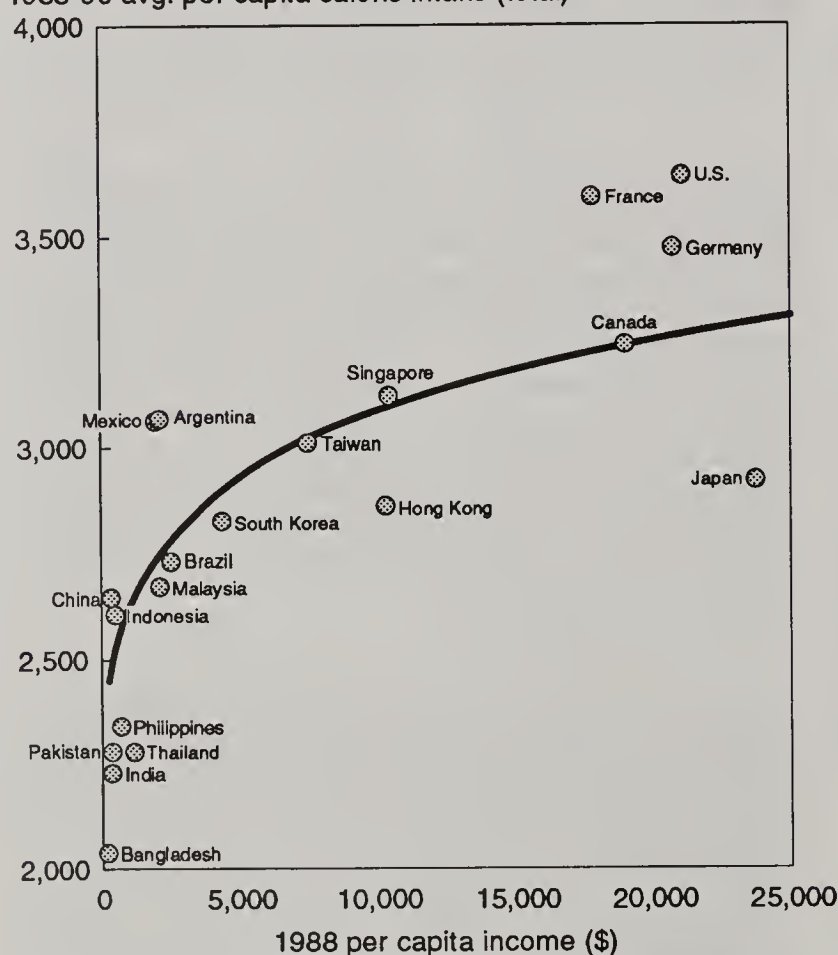
Also of fundamental importance in projecting food demand is the tendency for consumers to increase the intake of animal products as incomes rise. For higher income Asian countries, a significant portion of the growth in farm imports has consisted of either livestock feeds or livestock products, primarily meats. Again, Japan is an example of how cultural differences can vary the dietary role of livestock products across countries. Also, for the lower income Asian countries, income growth may be insufficient to generate major changes in meat demand in the 1990's. However, rising demand for animal products should have a significant impact on agricultural trade in many Asian countries, particularly in Southeast Asia, in the 1990's.

While rising incomes are associated with growth in livestock product demand in Asia, they also reduce demand for food staples, primarily rice.

Selected Countries

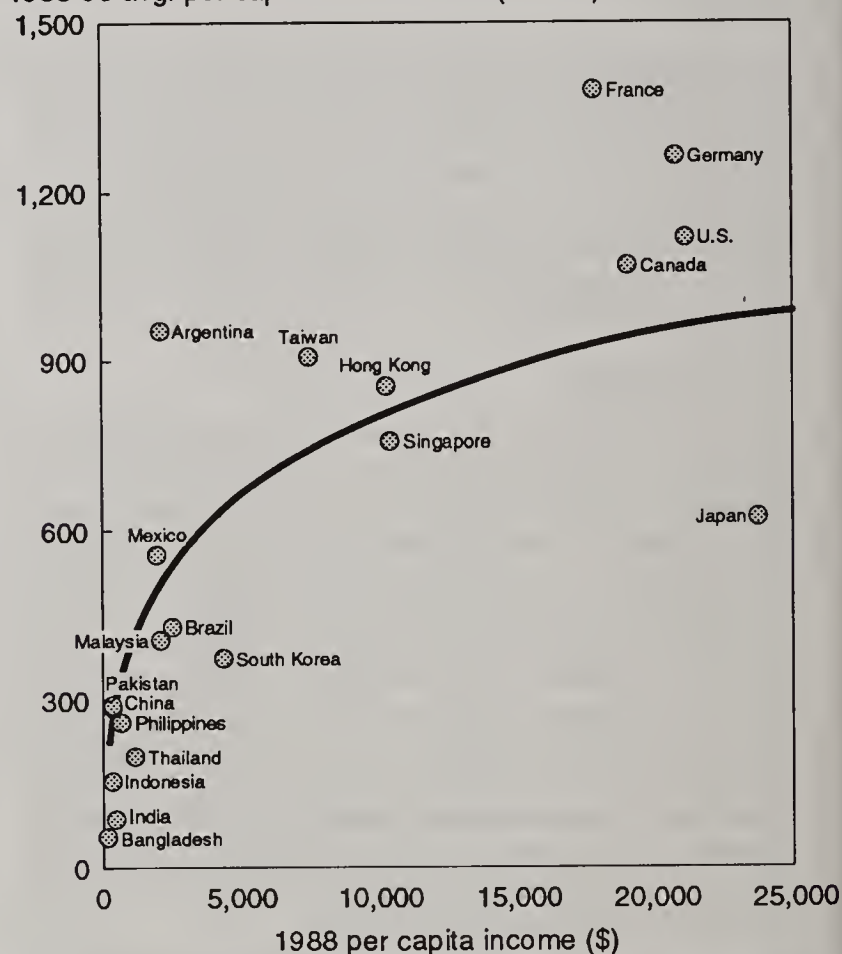
Per Capita Income and Caloric Intake

1988-90 avg. per capita caloric intake (total)



Per Capita Income and Intake of Animal Calories

1988-90 avg. per capita caloric intake (animal)



Indonesia

Kim Hjort and Rip Landes

Abstract: Indonesia is expected to sustain strong economic growth and become an expanding agricultural market in the 1990's. Rising import demand for wheat, feed protein, and cotton could provide opportunities for U.S. exporters. Farm exports, including palm oil and, possibly, corn are also projected to expand.

Keywords: Indonesia, agriculture, policy, trade, wheat, rice, corn, soybeans and meal, palm oil, cotton.

Introduction

Indonesia, Asia's third most populous country, has achieved rapid economic growth over the last two decades. Rising oil export revenues contributed to strong growth in income and trade in the 1970's and, although the economy slowed in the 1980's, performance was strong relative to other oil exporters. During the 1980's, Indonesian policies were distinguished from many other oil exporters by success in promoting investment and growth in nonoil sectors, including both industry and agriculture. Despite strong income gains, the expansion of farm output has limited growth in agricultural imports.

Agriculture remains a key sector of the Indonesian economy, accounting for 20 percent of output and 54 percent of employment, and playing a major role in reducing rural poverty. However, the industrial and service sectors now generate the bulk of income and trade. Petroleum, timber, textile, mineral, and fishery products account for most export earnings, while the role of farm products in nonoil exports has declined. Similarly, imports now consist primarily of machinery and chemicals, with agriculture's share falling to 11 percent in the 1980's. U.S. farm exports to Indonesia—mostly cotton, wheat, and soybeans—declined to an average of \$245 million, or 16 percent of Indonesia's farm imports, by 1988-90.

Successful economic and agricultural policies and rich agricultural resources have, so far, allowed domestic production to meet the bulk of Indonesia's expanding demand for farm products. In the 1990's, rising incomes will continue to strengthen demand for an increasingly diverse array of farm products. The trade impact of this process will likely hinge on the pace of income growth and diet diversification—particularly into livestock products—and progress in boosting productivity in spite of increasing constraints on arable land and irrigation. Also important will be the nature and impact of steps to reduce and redirect agricultural expenditures and, potentially, to reduce trade protection of some farm commodities.

Economic Trends and Policies

Aided by surging oil export earnings, Indonesia's real Gross Domestic Product (GDP) grew 7 percent annually during the 1970's, with imports expanding even more rapidly. In the early 1980's, however, economic performance deteriorated because of falling oil revenues, slow gains in nonoil exports,

and a weaker global economy. By the late 1980's, aided by a series of liberalizing structural reforms and inflows of foreign capital, the economy was back on a strong growth path. Overall, real growth averaged 5.4 percent in the 1980's, significantly higher than that achieved by most oil exporters.

Following the decline of the oil sector in the 1980's, the economy was sustained by the strong performance of agriculture and manufacturing. Agriculture grew at more than 4 percent annually, while manufacturing expanded by 9 percent. Sustained high growth was the result of the sometimes difficult policy adjustments to maintain macroeconomic stability and sustain investment in the face of fluctuating oil revenues. Accompanying adjustments in fiscal expenditures were measures to increase competitiveness by reducing domestic regulation and freeing up trade. In addition, the government was successful in attracting concessional and commercial foreign capital to sustain investment in key sectors, including agriculture.

Despite these successes, there are challenges to future economic performance. Deficits—both domestic and external—remain large and have created a growing reliance on foreign capital to maintain domestic investment. Foreign capital now accounts for nearly half of total public development expenditures and 40 percent of outlays for agriculture. Although prices have remained relatively stable, inflationary pressure—driven partly by domestic financing of deficits—looms as a threat to the economy. Finally, economic growth is increasingly threatened by deficiencies in physical infrastructure and human resources—principally skilled labor—that require more investment.

Trade Performance and Policies

Both imports and exports grew less than 2 percent annually during the 1980's. Overall export performance, however, masked strong gains in nonoil exports, including garments and manufactures, that offset declining oil revenues. Import growth was slowed by controls on trade and the strength of the economy in satisfying domestic demand. While the trade deficit remained largely in check, the current account deficit widened substantially because of the growing dependence on foreign capital. As a result, despite concessional terms for most foreign borrowing, the debt service ratio rose from 18 percent in the early 1980's to an average of 35 percent by the

late 1980's—significantly higher than in neighboring East and Southeast Asian countries.

Since the mid-1980's, Indonesia has substantially liberalized its trade regime to increase the competitiveness of the economy in general, and value-added nonoil exports in particular. Policies have included sharp cuts in nontariff trade barriers, conversion to tariffs, and subsequent tariff reductions for a broad array of industrial inputs and products. Initially, trade reforms focused on nonagricultural goods, but nontariff barriers to trade in many farm commodities were also reduced in 1991. Overall, trade protection remains higher in nonagriculture than in agriculture—with production of some farm goods taxed, rather than subsidized, by current policies. The government also adopted an aggressive exchange rate policy—including several devaluations in the 1980's—and now helps maintain export competitiveness through a managed float of the rupiah.

To sustain high growth, economic and trade policy is likely to continue to focus on reforms that will reduce domestic deficits, stimulate competitiveness of nonoil exports, and maintain the flow of domestic and foreign capital. There will be continued emphasis on increasing efficiency and investment in the nonoil economy, stimulating the private sector, and cutting the cost of public services. Prospects will likely be closely tied to external factors, including the price of oil and other commodities, growth in demand for nonoil exports and, increasingly, the availability and cost of foreign capital.

The pace of trade reform could be slowed if imports respond more rapidly to liberalization than exports, creating an untenable balance of payments squeeze. Liberalization of imports of major farm commodities that continue to be controlled—including wheat, rice, soybeans, and sugar—may hinge on ability to absorb both foreign exchange and domestic adjustment costs.

Agricultural Trends and Policies

The farm sector registered strong growth in the 1970's and 1980's, although growth in production of most major commodities slowed in the 1980's (table F-1). Output of rice, the major crop and food staple, continued to expand rapidly. Other key trends were sustained high growth in palm oil output, the principal tree crop product and export, and faster growth in production of livestock products and soybeans. In general, gains in crop production are associated with rising productivity and expanding area, resulting from more irrigation, higher cropping intensity, and the continued clearing of forest land.

Demand for farm commodities, and particularly food grains, also slowed in the 1980's (table F-2). However, demand appears to have strengthened for nonstaples such as livestock products and feeds. Domestic cotton use—the bulk of which fuels rapidly expanding textile exports—also sustained high growth. The slowdown in aggregate agricultural demand in the 1980's was caused by weaker income growth combined with a sharp turnaround in real price trends compared with the 1970's (figure F-1). Current higher prices for many farm goods are the result of booming demand in the nonoil sector,

Table F-1. Indonesia: Trends in production of selected farm commodities

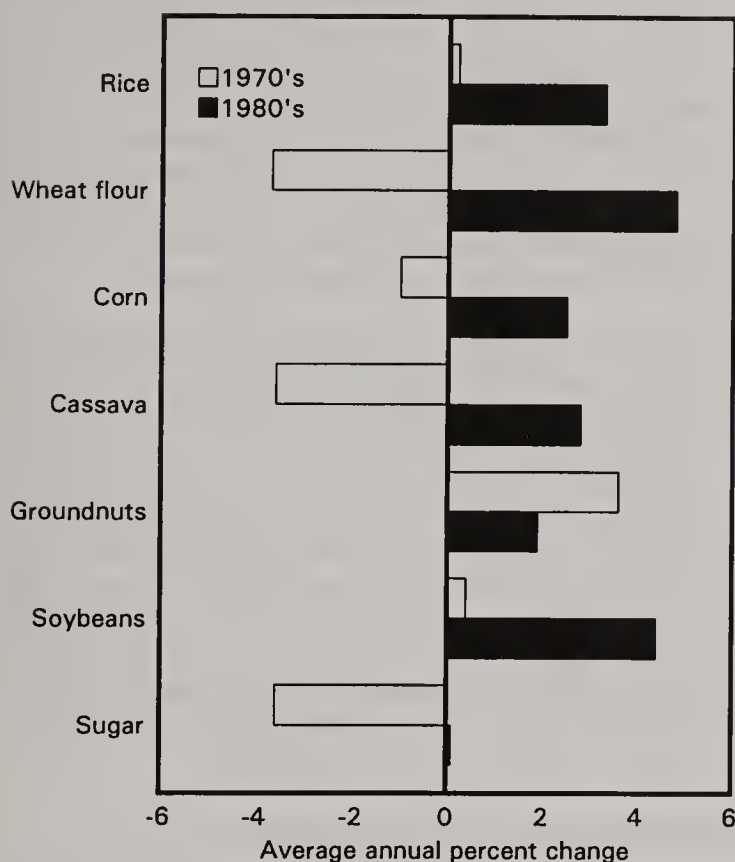
	1969- 1971 avg.	1979- 1981 avg.	1989- 1991 avg.	Growth rates ----- 1970's 1980's	
	-----Million tons-----			---Percent---	
Rice	13.04	20.11	29.04	4.40	3.70
Corn	2.58	4.04	5.17	4.60	2.50
Cassava	10.74	13.50	16.43	2.30	2.00
S. potato	2.22	2.12	2.06	-.40	-.30
Soybean	.51	.63	1.31	2.10	7.60
Groundnut	.46	.72	.91	4.60	2.30
Sugar	.96	1.59	2.27	5.10	3.60
Rubber	.79	.98	1.25	2.30	2.40
Palm oil	.25	.78	2.65	12.30	13.00
Coconut	6.28	11.20	12.95	6.00	1.50
Coffee	.18	.30	.41	5.10	3.30
Fruits	3.80	4.94	6.34	2.70	2.50
Vegetables	2.30	2.43	4.17	.60	5.50
Beef	.14	.16	.18	.90	1.50
Pork	.12	.13	.29	.70	8.40
Poultry meat	.06	.17	.46	10.30	10.70
Milk	.04	.08	.31	6.60	14.80

Sources: FAO; USDA.

Table F-2. Indonesia: Trends in consumption of selected farm commodities

	1969- 1971 avg.	1979- 1981 avg.	1989- 1991 avg.	Growth rates ----- 1970's 1980's	
	-----Million tons-----			---Percent---	
Rice	13.72	21.23	29.12	4.50	3.20
Wheat	.55	1.35	1.99	9.40	4.00
Corn	2.35	4.03	5.27	5.50	2.70
Soybean	.51	.89	1.80	5.80	7.30
Soybean meal	--	.09	.26	N/A	11.20
All oilmeals	--	.25	.60	N/A	9.20
Palm oil	.03	.45	1.40	31.00	12.10
All oils	.41	1.17	2.21	11.10	6.50
Cotton	.04	.11	.32	10.40	11.40

Figure F-1

Indonesia: Trends in Real Wholesale Prices

Source: Government of Indonesia

monetary expansion, and hikes in administered farm prices in the late 1980's.

Indonesia's net agricultural exports showed strong growth in the 1980's, with the farm trade surplus expanding about 24 percent annually to about \$2.2 billion by the end of the 1980's. Farm exports grew more than 8 percent annually during the 1980's and now account for about 26 percent of total nonoil exports. Tree and beverage crops, including rubber, palm oil, and coffee, still account for most farm exports, but exports of fishery products, processed foods, fruits, and vegetables are expanding most rapidly.

Total farm imports did not expand during the 1980's, remaining at about \$1.5 billion—the eighth largest in Asia. However, there were significant shifts in composition. Imports of rice, sugar, and processed foods declined, but there were offsetting increases in imports of such goods as wheat and cotton—neither of which is produced domestically—as well as soybeans and meal. U.S. farm exports to Indonesia declined in the 1980's, falling to an average of \$245 million in 1988-90, down 36 percent from 1979-81. Raw cotton is the largest and most rapidly expanding U.S. farm export to Indonesia. Other U.S. farm exports are concessionally supplied wheat, and commercially supplied soybeans and soybean meal, all of which have declined in recent years.

Producer Policies

The performance of the farm sector has been supported by macroeconomic and sector-specific policies. Macroeconomic policy has benefited agriculture by maintaining price stability,

flexible exchange rate management, and high public investment. Within agriculture, government intervention has supported increased investment in irrigation, research, and extension, input subsidies that have cushioned producers against adverse terms of trade, and trade and price policies that have provided farm price stability, if not price subsidies. The rationale for government intervention has focused heavily on two issues: 1) the growing need to diversify output and exports to sustain economic growth, and; 2) the pivotal role of agricultural development in alleviating rural poverty.

Despite the impact of falling oil prices on revenues, public expenditure on agriculture remained high, relative to other countries and other sectors of the Indonesian economy during the 1980's. More than 9 percent of public expenditure was directed at agriculture. Subsidies on fertilizer and pesticides accounted for the bulk of outlays until the late 1980's, when priority was given to irrigation investment. Research and extension, focusing heavily on the development and promotion of high-yielding rice varieties, accounted for remaining outlays. Foreign assistance has been key in maintaining expenditures on agriculture, providing 40 percent of outlays in 1990/91, compared with 11 percent in 1982/83. Most dependent on foreign funding are estate crops and research (more than 75 percent) and irrigation (59 percent).

Fertilizer and pesticide subsidies have been a key element of the government's program to achieve rice self-sufficiency. Domestic fertilizer prices were maintained at below world prices throughout the 1980's, and the subsidy has been unaffected by pressures on the government budget. Environmental concerns led to elimination of the pesticide subsidy in 1988/89. The fertilizer subsidy remains, despite high levels of fertilizer application and growing evidence of low economic returns, because of official concerns with the impact of subsidy reduction on rice yields.

Despite significant trade policy reforms in 1991, price and trade policies still isolate domestic prices of major crops from world markets. These policies provide relatively low protection to the farm sector as a whole—particularly relative to manufacturing—but there is variation across commodities. In general, domestic prices of import-substituting commodities are above world prices, and those of export-oriented commodities are at or below world prices.

For rice, despite price supports and an import monopoly administered by the National Logistics Agency (BULOG), producer rice prices remain near import parity. Domestic prices of corn, which is both imported and exported, now also range near import parity since corn trade was deregulated in 1989. For palm oil, export taxes have been eliminated and domestic producer prices have been linked closely to world markets since decontrol in 1991. Producer prices of soybeans and sugar are, however, distorted by current policies. BULOG's monopoly on soybean imports has provided a large price subsidy for domestic producers and processors. An import monopoly has also held domestic sugar prices above the world market.

Consumer Policies and Agricultural Demand

The government also intervenes in domestic marketing of many farm commodities. In the case of rice, BULOG attempts to stabilize availability, particularly for some segments of the population, through storage and distribution of domestically procured and imported rice. Sales of wheat are at administered prices that assure profits to millers and, to prevent disincentives for rice production, tax consumers of wheat flour. For wheat, government intervention appears to lead to high, inefficient domestic marketing margins, further increasing consumer costs. The impact of rice and wheat policies has likely been to slow growth in wheat consumption, including the substitution of wheat for rice in diets—a pattern that normally accompanies the growth of incomes and urbanization in Asia.

Consistent with the impact of trade policies on producers, domestic consumers and processors of soybeans and sugar are more heavily taxed than are consumers of rice and wheat. However, high domestic soybean prices, combined with quantitative controls on soybean imports and tariffs on meal imports, constrain growth elsewhere in the sector. These policies drive up costs of producing soy-based food products and tax producers and consumers of livestock products.

In contrast, imports of raw cotton, which is not produced domestically, have been liberalized since the mid-1980's, contributing to rapid growth in Indonesia's export-based textile industry. Similarly, the 1991 deregulation of the palm oil sector may have improved incentives for domestic processors, as well as prospects for domestic production and exports.

Issues Affecting Agricultural Trade in the 1990's

Indonesia's largely successful efforts at economic development and poverty alleviation stimulated agricultural exports during the 1980's, but did not lead to significant growth in agricultural import demand. Whether sustained development will lead to more significant growth in farm imports in the 1990's will depend on several key issues. Among these are the prospects for economic growth, for achieving adequate gains in productivity of major crops, and for modifying the major distortions created by current agricultural policies.

Economic Growth

The rate of economic growth achieved during the 1990's will affect aggregate demand for farm products, and the pace of diet diversification. Real per capita income grew at an annual rate of 4.6 percent in the 1970's and 3.4 percent in the 1980's. While farm output largely kept pace with demand in the 1970's and the 1980's, sustained income growth will place new pressures on the farm sector in the 1990's. Among these pressures will be rising demand for livestock products and feeds, a weakening preference for rice, and, depending on government price policies, a strengthening preference for wheat.

In the base projections presented below, real GDP is assumed to expand 6 percent annually during the 1990's. Projected

growth is faster than the 5.4 percent growth of the 1980's, but slower than during the 1970's. The population growth rate is projected to continue to decline from 2.0 percent in the 1980's to 1.5 percent in the 1990's, resulting in a per capita income growth rate of 4.5 percent in the 1990's. Underlying this outlook is the expected gradual rise in real oil prices, combined with stronger growth in Indonesia's manufacturing sector and nonoil exports. Further liberalizing reforms to domestic industries and the trade regime are likely to support sustained growth, as well as maintain critical inflows of foreign assistance and investment capital.

Several factors could lead to even stronger growth in per-capita incomes in the 1990's. Significantly higher oil prices could spur stronger growth, as could increased demand for Indonesia's agricultural or manufactured exports. The current outlook for Indonesia's nonoil exports is tempered by prospects for sluggish economic growth in the major developed-country markets. However, this effect could be offset by trade with faster growing Asian neighbors, particularly with the onset of freer trade among members of the Association of Southeast Asian Nations (ASEAN). Also, while the current outlook suggests that Indonesia's growth will be impeded by a shortage of foreign capital, this constraint could be overcome by larger inflows of private foreign investment.

Agricultural Land and Productivity

Agricultural growth over the last two decades has been based on gains in area planted and, for some crops, yields. Prospects for further area expansion vary on and off Java. On Java, where the bulk of rice and food crop area is located and most output gains have been achieved, the scope for expanding net cropped area is constrained by high development costs and intense pressure to shift land to nonfarm uses. Areas off Java are increasingly important for food and tree crop production, and development is critical to poverty reduction. Constraints to developing agricultural land off Java are largely economic and environmental, involving significant investment in irrigation and careful management of environmental impacts.

During the 1980's, the expansion of irrigated area was a key factor in the growth of net cropped area and, by permitting increased cropping intensity, in growth of total harvested area (figure F-2). However, the real per hectare cost of irrigation is rising, largely because remaining irrigable land is more expensive to develop. In addition, because of these high marginal costs, there is growing pressure to divert funds to agricultural research and extension where returns are deemed higher. As a result, growth in both net and gross cropped area is expected to slow during the 1990's, with the bulk of new land development occurring off Java.

Although Indonesia has achieved high growth in yields of selected crops, including rice and oil palm, yields of most crops are relatively low. This pattern reflects the concentration of research, extension, and promotion efforts, and of irrigated area, on production of certain crops, particularly rice. Rice yields are now higher than most Asian countries, following rapid adoption of higher yielding varieties and more use of fertilizer and pesticides between the mid-1970's and the mid-1980's (figure F-3). Yield growth slowed in the late

Figure F-2

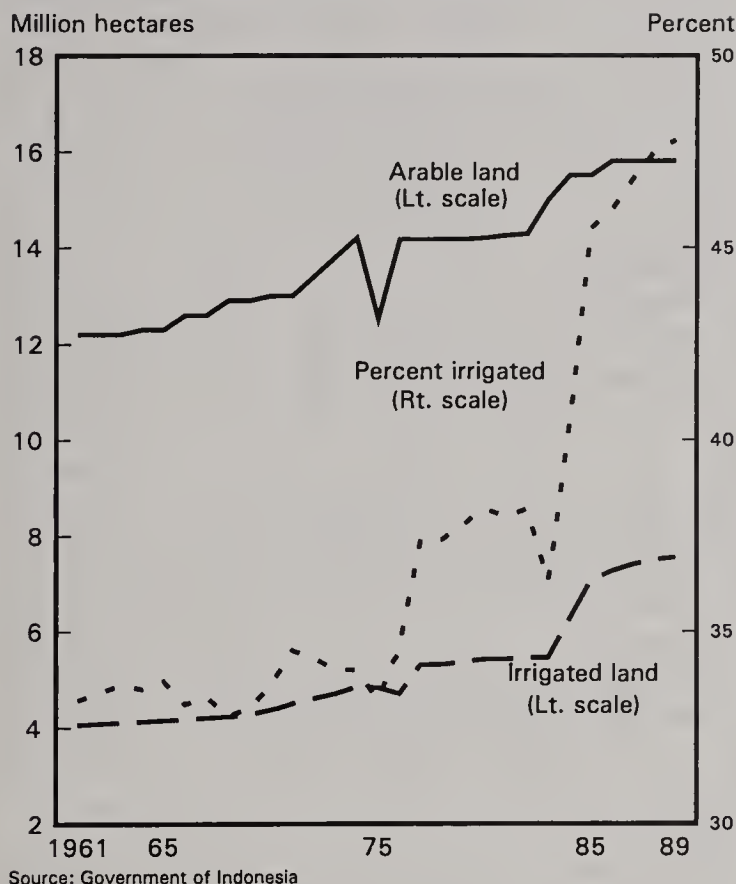
Indonesia: Trends in Irrigated Area

Figure F-3

Indonesia: Rice Yields

1980's, after widespread adoption of new varieties and inputs. However, there is broad scope for more incremental gains by improving cultural practices, if producer incentives are adequate. Significant varietal breakthroughs associated with hybridization may be possible by the late 1990's.

For other crops, low yields stem either from failure to adapt or use existing technology, or from agronomic constraints. Institutional support for other crops is traditionally weak. There appears to be potential for replicating the rice success on corn. Use of improved and hybrid corn varieties is now very limited and, if extension and promotion efforts are increased, existing technology could lead to significant yield gains. For soybeans, however, the need for a shorter-duration variety that could boost both area planted and yield poses an agronomic constraint. There also appear to be climatic constraints on achievement of high enough sugarcane and sucrose yields to be internationally competitive. As a result, no major breakthroughs in soybean or sugarcane yields are likely.

Agricultural Policy

Current agricultural policies are likely to be under pressure to adjust in several key areas during the 1990's. First, public expenditure on agriculture is unlikely to rise in real terms, and may have to be reduced. The domestic contribution to agriculture outlays will be under pressure from competing investment priorities, particularly infrastructure. At the same time, competition for the large foreign assistance component will likely remain stiff.

Second, even if the current level of expenditure is maintained, the allocation is likely to change. New irrigation development, the largest area of expenditure, could be cut to fund more maintenance of existing systems and, as noted earlier, to divert scarce resources to higher-return investments. Fertilizer subsidies, the second largest outlay, are under criticism because fertilizer use on some crops is already high and, likely, inefficient. Fertilizer subsidies have been reduced recently, and further gradual reductions are assumed. In contrast, expenditures on research and extension programs are expected to rise in the 1990's. A major focus of these expenditures is expected to be on secondary crops, livestock, and areas off Java that have received limited funds in the past.

Third, maintenance of rice self-sufficiency may require further adjustments in rice price policy. Higher domestic prices contributed to self-sufficiency gains in the 1980's, and further increases may be needed to manage demand and induce improved yields in the 1990's. In the base projections provided below, it is assumed that a closer link between domestic producer prices and import parity prices will be established, resulting in a modest real increase in domestic rice prices.

Fourth, current policies towards the major protected crops, soybeans and sugar, are likely to be under increasing pressure for reform. High protection of soybeans is diverting land from crops that are produced more efficiently, including rice and corn, as well as impeding development of the livestock sector. However, a sweeping reform of the sector is neither under discussion nor expected. Therefore, for the base scenario, it is assumed that the current rate of protection for

soybeans will be maintained. Consistent with the recent reduction of the 40 percent tariff on soybean meal imports, the tariff is reduced to 5 percent by 2000. Sugar is not included in the projections, but sugar policies affect area planted to other crops, particularly rice. Protection of sugar is assumed to be reduced slightly in order to balance relative incentives for rice and sugar cultivation.

A final area where change is likely is in improving marketing efficiency. Both reduced government intervention, and increased investment in market infrastructure, should contribute to declining marketing margins during the 1990's. In the case of rice, some BULOG marketing operations may no longer be needed to meet price stabilization objectives. In the case of wheat, both subsidies for the development of flour mills and taxes on consumers are losing justification. While major marketing reforms are not anticipated, the base projections incorporate the assumption that marketing margins for rice, wheat, corn, and soybeans will shrink gradually.

Agricultural Trade Prospects to 2000

The base projections provide a mixed outlook for growth in agricultural trade in the 1990's. Import demand for wheat and cotton is projected to remain strong, although somewhat slower than during the 1980's, while growth in soybean meal imports is expected to accelerate. On the other hand, the base projections indicate continued rough self-sufficiency in rice, and Indonesia's emergence as a net exporter of corn. Growth in exports of palm oil is projected to remain strong.

Rice

Annual growth in rice output is projected to slow to 1.6 percent, with smaller gains in both area and yield compared with the 1980's (table F-3). Area expansion is projected to drop to .5 percent annually, primarily because of the outlook for slower gains in total irrigated area and cropping intensity, particularly on Java. Some increases in rice area are expected as price incentives are altered to shift sugarcane area to rice on Java, and as more irrigated and unirrigated land off Java is planted to rice.

Yield growth is projected to fall to 1.1 percent annually, the result of less growth in irrigated rice area and less scope for gains from use of existing varieties or more fertilizer, particularly with declining fertilizer subsidies. Future yield gains are driven by more gradual improvements in cultural practices. Rice area and yield projections are consistent with less than a 1 percent annual increase in real producer prices, significantly less than during the 1980's.

The demand projections call for per-capita rice consumption to remain roughly constant during the 1990's, leading to substantially slower growth in rice consumption compared with the 1980's. The result is driven primarily by income effects, which indicate that income gains will, increasingly, be spent on nonstaple foods. Real rice prices are projected to decline slightly at the consumer level, with modest improvements in marketing efficiency more than offsetting the effect of slightly rising producer prices.

Table F-3. Indonesia: Base projections for grains

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates	
				1980-90	1992-00
				-----Million tons-----	---Percent---
Wheat					
Net imports	1.36	2.03	3.00	4.1	4.0
Consumption	1.35	1.99	2.97	4.0	4.1
Food	1.35	1.87	2.69	3.3	3.7
Per cap. (Kg)	8.70	9.87	12.15	1.3	2.1
Feed	.00	.12	.28	N/A	8.7
Rice					
Area (Mil. ha)	9.06	10.39	10.91	1.4	.5
Yield (Tons/ha)	2.21	2.80	3.11	2.4	1.1
Production	20.11	29.04	33.97	3.7	1.6
Net imports	1.48	.17	-.05	-19.7	N/A
Consumption	21.23	29.12	33.89	3.2	1.5
Per cap. (Kg)	136.99	153.96	153.17	1.2	-.1
Corn					
Area (Mil. ha)	2.76	2.82	3.13	.2	1.0
Yield (Tons/ha)	1.46	1.83	2.30	2.3	2.3
Production	4.04	5.17	7.18	2.5	3.3
Net exports	-.03	-.05	.31	5.6	N/A
Consumption	4.03	5.27	6.86	2.7	2.7
Food	3.45	3.08	2.67	-1.1	-1.4
Per cap. (Kg)	22.25	16.28	12.07	-3.1	-2.9
Feed	.58	2.19	4.19	14.2	6.7

Together, the rice supply and demand projections are consistent with a further decline in average rice imports during the 1990's, and with rough self-sufficiency in 2000. Because of the vagaries of weather, self-sufficiency will likely take the form of periodic and roughly offsetting imports and exports during the 1990's.

Wheat

Wheat consumption and imports are projected to expand rapidly in the 1990's, with imports rising 4 percent annually to 3 million tons in 2000. Per-capita wheat consumption is expected to rise due to both income and price effects. As in other Asian countries, increasing incomes and urbanization are projected to lead to more demand for wheat-based food. In addition, wheat consumption is expected to be boosted by a gradual decline in domestic prices, a result of the outlook for declining world wheat prices, as well as a gradual reduction in wheat marketing costs.

Corn

Corn production is projected to expand more rapidly in the 1990's than in the 1980's. Adoption of improved varieties and inputs is expected to maintain yield growth, although

Table F-4. Indonesia: Base projections for oilseeds and products

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1990-00
	avg.	avg.			
	-----Million tons-----			---Percent---	
Soybeans					
Area (Mil. ha)	.72	1.22	1.31	5.5	.7
Yield (Tons/ha)	.87	1.07	1.24	2.1	1.5
Production	.63	1.31	1.63	7.6	2.2
Net imports	.27	.52	.74	6.5	3.6
Consumption	.89	1.80	2.36	7.3	2.8
Crush	.00	.19	.36	N/A	6.6
Other 1/	.89	1.60	2.00	6.1	2.2
Per cap (kg)	5.74	8.48	9.03	4.0	.6
Soybean meal					
Production	.00	.16	.29	N/A	6.5
Net imports	.10	.10	.32	-.4	12.5
Consumption	.09	.26	.60	11.2	8.9
Per cap. (Kg)	.60	1.35	2.73	8.4	7.3
Palm oil					
Production	.78	2.65	6.20	13.0	8.9
Net exports	.33	1.26	3.50	14.4	10.8
Consumption	.45	1.40	2.70	12.1	6.8
Per cap. (Kg)	2.85	7.38	12.20	10.0	5.2

1/ Mostly food; includes a small amount fed to animals.

projected yields in 2000 remain well below the potential of available technology. With domestic producer prices assumed to rise slightly in real terms, higher yields boost per hectare returns, leading to gains in corn area both on and off Java.

Growth in corn demand is projected to be about the same in the 1990's as in the 1980's, the result of two offsetting effects. Food demand, which accounts for about a third of corn use, is expected to decline as rising incomes sustain a dietary shift toward wheat and other foods. Feed use of corn, however, is projected to continue expanding rapidly, driven by growth in domestic consumption and production of livestock products. Underlying the feed demand outlook is projected annual growth in poultry and pork production of about 7 percent throughout the 1990's.

The base supply and use projections result in net exports of about 300,000 tons by 2000, compared with small net imports at present. While the analysis suggests this as the likely outcome, the results are sensitive to both the yield and feed use assumptions. In the case of feed use, some analysts feel

that available estimates of feeding rates and feed use significantly understate actual use. To the extent this is true, the projections may understate future corn demand. Alternate yield assumptions are analyzed below.

Soybeans and Meal

Growth in soybean production is projected to slow significantly in the 1990's (table F-4). The base assumption of a constant rate of protection for soybeans, combined with slowed expansion of gross cropped area, leads to a sharp reduction in area growth in the 1990's. Agronomic constraints and lower prices also limit the potential for improving yields. While growth in soybean production slows, demand for soybean meal is projected to remain strong, rising 9 percent annually. Demand remains strong because of the expanding livestock sector, and lower soybean meal prices.

The combined impact of the soybean production and meal demand projections is a widening supply-demand gap for feed protein. The bulk of this gap is expected to be filled by imports of soybeans and meal. The shares allocated to each hinge on future decisions to build crushing capacity, as well as the outlook for declining food demand for soybeans as incomes rise. Although feed mills now prefer to import meal, the projections incorporate the assumption that domestic crushing capacity will expand 5 percent annually as rising feed demand makes crushing enterprises more profitable. With these assumptions, growth in soybean imports slows to about 4 percent per year, while growth in meal imports accelerates to more than 12 percent annually.

Palm Oil

Palm oil production expanded rapidly during the last two decades and is projected to sustain strong growth in the 1990's (table F-4). Although the major area expansion of oil palm was completed in the 1980's, yields should continue to show strong improvement as trees planted in the mid- and late 1980's reach their peak oil-bearing age during the 1990's. Current plantings, plus continued support for smallholder tree-crop planting off Java and improvements in varieties and input uses, are projected to sustain annual growth in palm oil production of nearly 9 percent during the 1990's.

Growth in domestic palm oil demand, historically sensitive to rising income and population, is projected to slow sharply compared with the 1980's, but remain strong at nearly 7 percent annually. The projected slowdown is explained by the success achieved in raising per-capita consumption in the 1980's, and the likelihood that the sector will be more export-dependent in the future. With this outlook for production and use, palm oil exports are projected to grow at an annual rate of nearly 11 percent, compared with 14 percent in the 1980's.

Cotton

Cotton imports and mill consumption expanded more than 11 percent annually during the 1980's, driven by rising domestic textile demand and rapid growth in textile exports. While future prospects for the sector appear bright, its expansion is

Table F-5. Indonesia: Base projections for cotton

	Growth rates			
	1979-	1989-	2000	
	1981	1991	1980-90	1992-00
	avg.	avg.		
	-----Million tons-----		---Percent---	
Cotton				
Net imports	.11	.32	.49	11.7 4.4
Consumption	.11	.32	.49	11.4 4.4

Table F-6. Indonesia: Results of high income scenario

	2000		
	Base	High	Change
	scenario	income	
	----Million tons----		Percent
Net imports			
Wheat	3.00	3.15	5.0
Rice	-.05	.12	-359.6
Cotton	.49	.51	3.2
Soybeans	.74	.79	7.5
Net exports			
Corn	.31	.30	-3.2
Palm oil	3.50	3.16	-9.7
Consumption			
Wheat	2.97	3.12	4.9
Rice	33.89	34.00	.3
Corn	6.86	6.92	.9
Food	2.67	2.53	-5.1
Feed	4.19	4.39	4.8
Soybeans	2.36	2.42	2.5
Crush	.36	.39	8.0
Other 1/	2.00	2.03	1.5

1/ Mostly food; includes small amount fed to animals.

assumed to slow relative to the 1980's (table F-5). First, 1980's growth was achieved from a small base and is unlikely to be sustainable. Second, textile trade quotas for major textile importers under the Multi-Fiber Agreement (MFA) are likely to eventually impose a constraint on Indonesia's exports to these markets.

The effects of constraints imposed by the MFA are difficult to quantify. It is unclear how much of the raw cotton now used by mills is destined for textile exports, and it is difficult to predict Indonesia's future quotas. For the purpose of the projections, growth in consumption is based on projected domestic demand, the outlook for sluggish global income growth, and less responsiveness to global demand than was evident in the 1980's. With these assumptions, cotton imports and consumption expand at about 4.5 percent per year, reaching .5 million tons by 2000. However, stronger growth may

be sustained if the MFA quotas are either removed or are less restrictive than anticipated.

Impacts of Stronger Income Growth

In the base projections, real GDP is assumed to grow at an annual rate of 6 percent. However, income growth could be stronger if future export demand or the impact of market-oriented economic reform exceeds current expectations. Income growth could exceed the base assumption if the economy responds more rapidly than anticipated to policy reform, or if foreign capital inflows continue at a high rate. Given the strong historical relationship between growth in incomes and agricultural trade in many Asian countries, it is useful to evaluate the potential impact of stronger growth.

Table F-6 summarizes the trade impacts of increasing the annual growth rate of real GDP to 7 percent. Significant increases are estimated in net imports of soybeans, wheat, and rice. For wheat, soybeans, and cotton, higher demand is unlikely to be fully offset by increased production. In the case of rice, however, the projected imports could be avoided with a relatively small increase in the domestic price of rice. Increases in feed demand associated with higher incomes lead to substantially higher imports of soybeans, and lower exports of corn. Palm oil exports also fall significantly because of increased domestic demand.

Impacts of Alternate Yield Assumptions

Future trends in rice and corn yields are particularly important to Indonesia's trade outlook. The outlook for rice and corn yields in Indonesia is complicated by the uncertain impact of the expected reduction in support for fertilizer and irrigation in favor of improved research and extension. For corn, there is a question of how quickly already existing technology will be adopted by farmers. Tables F-7 and F-8 summarize the results of alternate yield scenarios implemented by 50 percent adjustments in the impact of technology (trend), while leaving the input and output price parameters unchanged.

The rice results again highlight the sensitivity of projected rice trade to alternate assumptions. The results assume that the government adjusts the rice support price in an effort to maintain self-sufficiency. The impacts of the low-yield scenario include a sharp increase in import demand, as well as higher producer and consumer prices. In this case, maintenance of self-sufficiency would require significantly higher domestic prices. By contrast, the faster yield growth scenario indicates significantly lower internal prices and higher rice exports.

The sensitivity of the corn export projection to alternate rates of technology adoption is seen in table F-8. If the accelerated rate of technology adoption assumed in the base projection does not materialize, the slow-yield-growth scenario suggests that corn exports will remain negligible. However, corn yields remain relatively low even in the high scenario, indicating that stronger growth in yields and exports is also feasible.

Table F-7. Indonesia: Results of rice yield growth scenarios

2000					
	Base scenario	Fast rice yield growth	Change from base	Slow rice yield growth	Change from base
	---Mil. tons---		%	Mil. tons	%
Yield (Tons/ha.)					
Rice	3.11	3.21	3.2	3.00	-3.5
Production					
Rice	33.97	34.76	2.3	32.80	-3.4
Corn	7.18	7.22	.4	7.17	-.2
Net imports					
Soybeans	.74	.72	-2.3	.74	.8
Net exports					
Rice	.05	.86	1,719.1	-1.12	-2,491.5
Corn	.31	.35	12.4	.30	-4.5
Palm oil	3.50	3.60	2.9	3.48	-.6

Table F-8. Indonesia: Results of corn yield growth scenarios

2000					
	Base scenario	Fast corn yield growth	Change from base	Slow corn yield growth	Change from base
	---Mil. tons---		%	Mil. tons	%
Corn					
Area (Mil. ha)	3.13	3.14	.4	3.15	.7
Yield (Tns/ha)	2.30	2.38	3.5	2.21	-3.9
Production	7.18	7.47	4.0	7.11	-1.0
Consumption	6.86	6.86	.1	7.04	2.6
Net exports	.31	.59	88.5	.06	-80.3

Impacts of Alternative Policy Assumptions

Two of the more uncertain policy assumptions underlying the base projections concern rice and soybeans. The key policy assumption underlying the base projections for rice is that the government, through price and trade policy measures, will continue to permit real rice prices to rise in order to sustain self-sufficiency. In the base scenario, domestic producer prices of rice rise to roughly 25 percent above the border price by 2000, based on the assumption of a further decline in world prices (Box 3). This may imply some protection of domestic rice production that could become a target of reform efforts.

Alternatively, perhaps in response to bilateral or multilateral pressures, the government could pursue a more liberal policy and allow internal prices to rise only to the border price. The result, assuming no impact on world prices, is a sharp increase in rice imports that is only partially offset by larger exports of other commodities (table F-9). However, these trade impacts could be mitigated by either a relatively small increase in world rice prices, or a minor discrepancy between domestic and world prices.

For soybeans, the base projections maintain current protection of relatively inefficient domestic production. However, the government could also opt to reduce the inefficiency involved in allocating scarce land to soybeans. Table F-10 indicates the potential impacts of reducing protection by lowering domestic producer prices to about 60 percent above import parity by 2000. The results indicate a 12-percent drop in domestic production compared with the base scenario, and a 22-percent increase in soybean and meal imports.

Implications for U.S. Trade

Indonesia's imports of wheat, cotton, and soybean products are projected to grow rapidly during the 1990's. The analysis suggests strong import growth for these commodities under a range of income growth and policy scenarios. Past performance suggests minimal prospects for an economic downturn, and import demand for each commodity would rise further if ongoing reforms lead to stronger growth in incomes. Similarly, likely policy alternatives would boost import demand for soybeans and products and, if domestic rice prices are increased to maintain self-sufficiency, wheat import demand stands to be strengthened. While the impact of the MFA

Table F-9. Indonesia: Results of rice price scenario

2000			
	Base scenario	Rice producer price change	Change from base
	-----Million tons---		Percent
Rice			
Area (Mil. ha.)	10.91	10.27	-5.9
Yield (Tons/ha.)	3.11	2.91	-6.4
Production	33.97	29.83	-12.2
Consumption	33.89	34.57	2.0
Net imports	-.05	4.78	-10,261.7
Memo items:			
Corn net exports	.31	.54	71.3
Palm oil net exports	1.75	1.89	7.7
Rice producer price 1/	370	275	-25.7
Rice consumer price 1/	518	401	-22.6

1/ Measured in 1987 rupiah/kilogram.

Table F-10. Indonesia: Results of soybean price scenario

	2000		
	Base scenario	Lower soybean producer price	Change from base
	---Million tons---		Percent
Soybeans			
Area (Mil. ha.)	1.31	1.22	-6.9
Yield (Tons/ha.)	1.24	1.17	-5.6
Production	1.63	1.43	-12.3
Consumption	2.36	2.47	4.8
Net Imports	.74	1.05	42.7
Soybeans and meal 1/			
Production	1.59	1.48	-7.4
Consumption	2.49	2.58	3.3
Net Imports	.91	1.12	22.2
Memo items:			
Soybean producer price 2/	540	410	-24.2
Soymeal consumer price 2/	258	261	1.2
Corn net exports	.31	.38	21.0

1/ Meal equivalent.

2/ Measured in 1987 rupiah/kilogram.

on future demand for raw cotton is unclear, the past rapid growth of textile exports under the MFA suggests that cotton import demand could be stronger than projected.

U.S. trade prospects will hinge on success in maintaining or improving U.S. competitiveness in the Indonesian market. In the case of wheat, stiff competition on the basis of price, quality, and freight costs, primarily from Australia, limits potential for increasing the U.S. share from the current 15 percent. However, there may be scope for increasing market share for soybeans and meal, either on the basis of superior quality or diminishing supplies from China—the current major supplier. Similarly, U.S. cotton may earn an even larger share of the cotton market because of the preference for U.S. quality, and because Asian cotton exporters are diverting more raw cotton to production and exports of textiles.

The analysis suggests that rice self-sufficiency is likely to be sustained. In most cases, relatively small adjustments in domestic prices can avoid significant rice imports. With continued variability in production and domestic prices averaging near world prices, there may be periodic imports and exports. While prospects for U.S. rice exports to Indonesia are negligible, they may continue to be indirectly affected by instability in Indonesian rice trade.

The projections indicate that, despite growth in feed demand, Indonesia is unlikely to import corn—the commodity for which the United States has been most competitive in Asian markets. In fact, unless the economy grows more rapidly than expected, Indonesia appears likely to emerge as a small competitor in Asian markets. Indonesia is also expected to sustain 11 percent growth in exports of palm oil, maintaining competition with U.S. oilseed products.

BOX 6

Prospects for Myanmar's Rice Exports

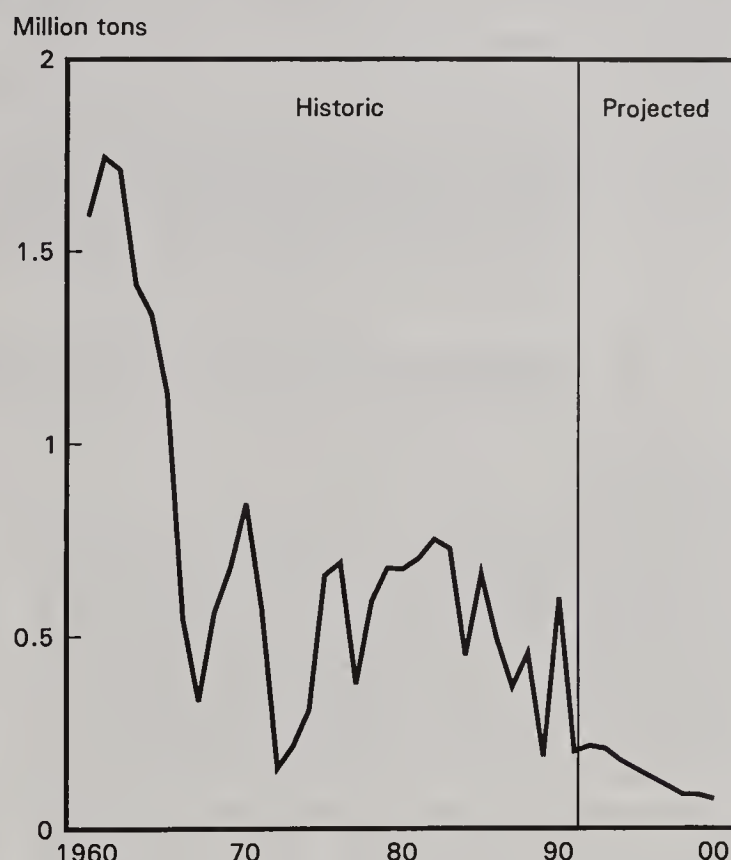
Myanmar, once one of the most prosperous countries in Asia, has been racked by political and economic instability in recent decades. Foreign aid has been cut off due to questions concerning human rights violations and refusals by the military junta to abide by 1990 election results. Despite recent growth spurred by the junta's economic reforms, persistent political problems and growing budget deficits make the future uncertain.

Myanmar's agriculture, centered on rice, sugarcane, and pulse production, accounts for approximately 40 percent of GNP and 65 percent of total employment. Until the mid-1980's, Myanmar was one of the world's major rice exporters. Even as recently as 1983, Myanmar was the world's fourth largest supplier, with exports approaching one million tons. Rice, once Myanmar's primary foreign exchange earner, has been usurped by teak wood and pulses.

Myanmar's political situation provides little basis to expect a significant improvement in economic performance or in rice exports. Growth in rice production is expected to slow due to lack of irrigation and infrastructure investment, and higher profitability of competing crops, particularly pulses, since the recent liberalization of border trade with Thailand and China. Government stores maintain subsidized prices for some basic commodities, including rice. However, rice consumption is expected to grow more slowly than population as expanding central government budget deficits, equal to 10 percent of GDP in 1990/91, make continuing consumer subsidies increasingly difficult.

As a result, Myanmar's rice exports are expected to continue the decline begun in 1983, falling to about one-third of the 1991 level over the projection period. Given the potential for expansion in harvested area and yields, it is technically feasible for Myanmar to again become a major rice exporter. However, such a change would likely require a fundamental alteration of policies, either by the current government or a new regime. There is no reason to believe that such a transformation will occur in the foreseeable future.

Myanmar: Rice Exports



Myanmar: Base projections for rice

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	Avg.	Avg.			
	-----Million tons-----			---Percent---	
Rice					
Area (Mil. ha)	4.68	4.68	4.60	.0	-.2
Yield (Kg/ha)	1.68	1.71	1.94	.2	1.3
Production	7.90	8.00	8.92	.1	1.1
Net exports	.68	.23	.08	-10.5	-9.4
Consumption	7.22	7.29	8.88	.1	2.0
Per cap.(Kg)	214.33	179.67	179.33	-1.7	.0

Japan

John Dyck

Abstract: Japan, the world's largest agricultural market, is expected to continue shifting from domestic production to imports to satisfy growing meat and dairy product demand. However, little growth is likely in grain and oilseed imports, and cotton imports are projected to fall. Structural change or completion of the Uruguay Round could alter the trade projections.

Keywords: Japan, agriculture, trade, structural adjustment, dietary change, wheat, rice, coarse grain, oilseeds and products, animal products, cotton.

Introduction

Japan is the largest net importer of agricultural products in the world, and the largest importer of U.S. agricultural products. Its agricultural trade is notable for its volume, value, and diversity. Japan's food and agriculture industries, among the world's largest, are an important part of the nation's economy, about 12 percent of GDP in 1990. Although agriculture's share has steadily declined to less than 3 percent, the food industry's share is over 9 percent and is more stable. About 14 percent of the population still lives in households engaging in some farm production. About 20 percent of household consumption expenditure is for food and beverages, \$325 billion in 1989.

Although Japanese consumption and imports span virtually all commodities, its agriculture specializes in rice, beef, pork, broilers, eggs, vegetables, and fruits. The Japanese diet, traditionally based on rice and other plants and fish, has shifted toward livestock products since World War II.

Macroeconomic Performance and Management

Japan is a mature industrial society, but until recently it grew faster than other developed economies. Japan's dynamic economy survived the oil crises of the 1970's and the nearly 40-percent appreciation of the yen in 1985-86. For most of the 1980's, Japan had low inflation of under 3 percent. Despite very low interest rates, private savings have continued to be very high relative to the rest of the world.

Although external shocks in the past did not affect Japan as much as expected, Japan currently suffers from slow growth and uncertain prospects as a result of the global economic slowdown of 1991 and the debt incurred by Japan's banks and industries in the 1980's. The value of real estate and stocks has fallen significantly, reducing the asset value of firms that have incurred high debt. The current weakness of industrial and financial firms means that investment and expansion are not being undertaken and the country's GDP growth rate for fiscal 1992 was only .8 percent.

The government of Japan has traditionally showed a lot of interest in the private sector, and often offered guidance and assistance. In the current slow-growth period, the government

has announced measures to ease the debt load of companies, spend public revenues on infrastructure development, and stimulate consumption. More government aid may be forthcoming.

Policy Reform and Adjustment

Japanese employees work more hours than workers in other developed countries. Housing prices are higher, and sizes smaller, than in countries with similar levels of wealth. Many consumer prices in Japan exceed those in other wealthy countries. Government studies in the 1980's explicitly targeted such aspects of everyday life and encouraged the public and private sectors to make changes. Saturday and evening work are being discouraged. Efforts to decentralize government and industry away from the major cities are often discussed and to some extent realized, so that larger houses and shorter commutes can become feasible for more households. Japan has made headway in opening its consumer markets to foreign competition, which is supposed to lead to lower prices.

Despite the market-opening steps taken in the 1980's, Japan's economy is still criticized as too closed to international competition. Ongoing negotiations with trade partners address this issue and may result in more market access in the future.

Trade Performance and Policies

Japan ran huge surpluses in its balance of trade during the 1980's, and the surplus continues to be very large. Exports tend to be technologically advanced and value-added products aimed at final consumers. Many of its imports are raw or intermediate goods. The country has profited greatly from this trade pattern, and part of the profit has been invested to ensure that Japan's exporters will be successful in the future. The private sector has also made large overseas investments in a broad array of industries and institutions, although both internal and external investment has fallen since 1991. The government has undertaken foreign aid programs and become one of the world's largest donors.

Japan is a member of the GATT, but has eschewed formal regional trade linkages. Industries and government have often worked in tandem to ensure smoothly operating markets for imported inputs and sometimes to ensure that markets for

Japanese exports operate smoothly. Preserving market shares, both for Japanese producers/exporters and for import sources has had more emphasis in Japan than in other capitalist economies.

Japan's formal trade barriers have been reduced gradually, often after strong foreign pressure. However, market entry remains difficult because of differences in business practices and because Japanese businesses are strong and resistant to new competitors. Some significant formal barriers remain, especially in agriculture. The changing nature and growing internationalization of consumption and business activity in Japan, however, mean that opportunities for foreign exporters and investors are growing. On balance, Japan's links to the world economy are growing, and the barriers to trade are weakening.

Agricultural Trends and Policies

Japan had a rice-based economy and food consumption pattern for hundreds of years. The influence of rice continues to be strong, but has waned in this century and is expected to weaken further. Since the 1950's, Japanese consumers have been eating more food and substituting animal protein and fats for starchy foods, especially rice. According to the official food balance sheets of MAFF, the first trend, adding more calories, largely ended by the early 1980's (figure G-1). The second trend continues, with rice consumption per person declining, and consumption of meats, dairy products, and fats and oils growing.

Farming in Japan is constrained by the high cost of labor and land. Although land costs have been declining in most rural

areas, they remain higher than in any of Japan's foreign competitors in agriculture. Labor costs, while dipping during the current slow growth period, will probably resume their climb later in the 1990's. Because of the small size of Japan's farms, especially rice farms, labor productivity is low. Given the high cost of labor, this means that Japan's rice farming is uncompetitive internationally. High land costs impede the consolidation of land through purchases. However, land rents are much lower, and have been decreasing, so that consolidation of rice farms through leasing is becoming more feasible.

Livestock Agriculture

While there has been relatively little change in the main field crop area, with small rice paddies still dominant, a large intensive livestock sector (swine, broilers, layers) and a dairy sector have grown up largely separate from rice-based agriculture. The beef industry, while evolving partly from the herd of Wagyu cattle used for fieldwork in rice farming, has become increasingly specialized and less closely connected to rice agriculture. Livestock accounted for about 27 percent of gross agricultural output in 1990. Livestock activities have been increasingly buffeted by foreign competition in the 1980's as protection by tariffs, variable levies, and quotas has been reduced or withdrawn.

Field Crops

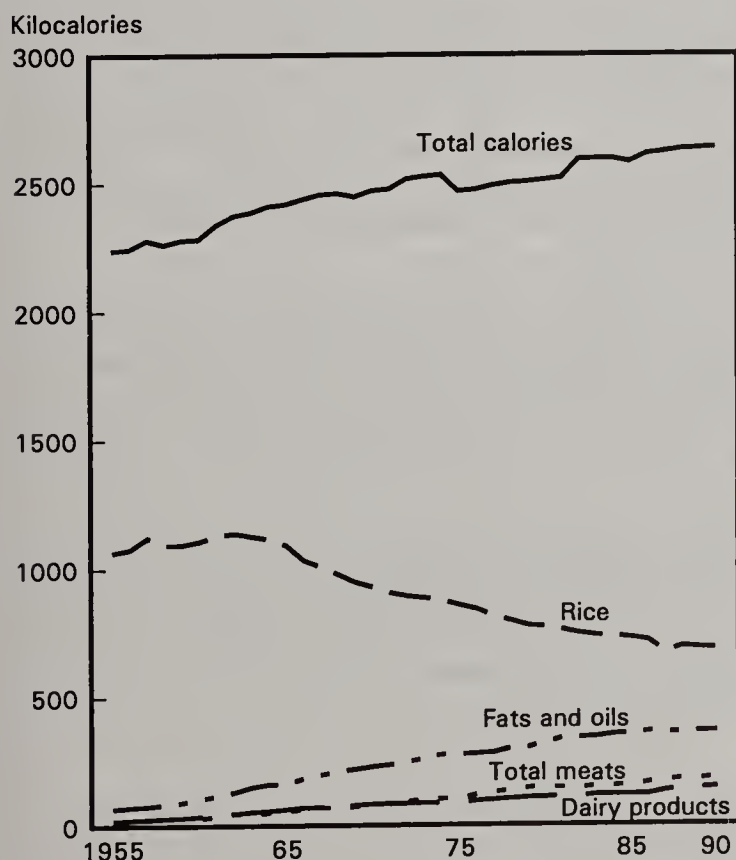
While the livestock sectors continue to change rapidly, crop agriculture in Japan has changed little, on the surface. Farms averaging 1 hectare dominate Japan's landscape as they have since the land reform of 1949. However, the true nature of these enterprises has changed considerably. The rice farms were the main economic activities of the farm owners into the 1960's. But the economic significance of rice farming to farm households has diminished greatly, so that since the mid-1980's the agricultural share of total household income of farm households in Japan has hovered around 15 percent.

Rice farming has become largely a part-time activity, performed by farm wives, people retired from nonagricultural careers, families working on farms on the weekends and evenings, and elderly farmers. Most of the income of farm households, especially on rice farms, comes from nonagricultural pursuits. Rice farming on the small paddies is maintained by government policies that raise the producer price of rice so that it is profitable to grow a crop even on a small scale, which guarantees a high cost of production. Rice production accounted for about 28 percent of gross agricultural output in 1990.

Other field crops often owe their continued existence indirectly to the rice policies or to other government policies. Such crops accounted for almost 7 percent of gross agricultural output in 1990. They include wheat, barley, and soybean production that has remained viable as a result of diversion payments designed to keep farmers from growing rice, and government control of wheat and barley imports. Trade barriers against sugar and starch imports and government dictates

Figure: G-1

Japan: Caloric Intake Per Day



on which raw materials to use in sweetener markets prop up domestic cane and beet sugar production and secure a processing market for sweet and white potatoes.

Fruits, Vegetables, and Floriculture

Other industries are more viable and less dependent on government policies, including the mikan and other citrus fruits, apples and other fruits, a wide array of fresh vegetables, flower and nursery products. These accounted for about 37 percent of gross agricultural product, and many of these activities are prospering because they cater to the Japanese consumers' penchant for freshness and diversity. While producers receive few direct subsidies, they do derive considerable protection from Japan's rigorous phytosanitary standards.

The Growing Role of Agricultural Imports

Food demand in Japan has changed greatly in the last 40 years, and has drawn increasingly on imported supplies, rather than domestic agriculture. On an original-calorie basis, imports now account for over 60 percent of Japan's food supply.

The imported foods and inputs to food production were, for the most part, not present in the old Japanese diet, and coincide to a great degree with the changes that have occurred in consumption. Livestock products of all kinds, starch-based sweeteners, and many processed foods are among the commodities that have essentially been added to the Japanese diet since World War II.

Recent changes in technology and trade barriers are opening the door to a somewhat different kind of substitution: imports are competing with products that have long been produced and eaten in Japan. Fresh vegetables, fresh fruits, food soybeans, and some traditional processed products all face this kind of competition. The mainstay of the old diet, japonica rice, will face strong competition if the import ban is relaxed.

Shifting Attitudes and Policies

This situation, with Japanese agriculture being marginalized by growing imports of nontraditional foods, and being directly challenged in foods that it has produced, underlies a sense of crisis that is likely to have policy implications.

While for most of the postwar period there has been an overriding concern for the welfare of Japan's 3 million farm households, the attention of the public and policymakers is now turning increasingly to preserving a competitive agriculture and reducing the costs of production. For most of the postwar era, the desire to see farm household income for all farms raised has led to policies that have reduced the competitiveness of Japanese farms.

A turning point came in the mid-1980's, when studies of Japan's economy and the agricultural sector recommended some sharp departures from previous policies. Since 1987, the nominal government purchasing price of rice has been cut by over 12 percent. This came after almost two decades in which that price had been raised or kept high in order to increase farm income.

The government's price bands for pork were dropped by 26 percent in 1986-89, the tariff on poultry imports was reduced in 1986-87, and milk price supports were reduced by 12 percent in 1986-91. In addition to these domestically-initiated measures, pressure from trade partners helped to liberalize trade in beef and citrus products and ended the export of subsidized rice. These measures coincided with and reinforced the renewed attention to making Japanese agriculture competitive with international agriculture and with the non-agricultural sectors inside Japan.

Policies to enhance competitiveness have gained wider acceptance among farmers, cooperatives, and the agricultural bureaucracy. A 1992 draft plan by MAFF proposes to accelerate and deepen the structural adjustment in rice agriculture that must occur as more and more labor is withdrawn from what remains a labor-intensive industry. The proposals envision a drastic decline in rice farm numbers by 2000, with a corresponding decline in costs of production as the average farm size increases. Some details of the draft plan are not yet available, some strategies may not be workable, and it has not yet been endorsed by the Diet. However, it is symptomatic of a growing anxiety and desire for change within agriculture.

Issues Affecting Agricultural Trade in the 1990's

The Japanese diet is expected to continue changing, but at a slower pace. Supply of food-related items will be increasingly competitive, with imports securing modest gains in their share of total supply. Imports of raw materials for manufacturing, such as cotton, are likely to decline precipitously as Japan's high labor and land costs cause textile, leather-goods, and other industries to move off-shore.

Income Growth and Its Effects on Food Demand

Japan's economic growth in the 1990's is still projected to be high and steady by developed country standards, if the country emerges soon from its current stagnation. The base scenario assumes a recovery in 1993-95 and then steady real growth averaging 3.4 percent per year for the rest of the decade (see Box 1). This seems optimistic but not impossible. If global economic growth does not recover, a lower rate would be likely in Japan.

Demand for meat and other livestock products, vegetable oil, sweeteners, and processed and convenience foods is expected to add calories, protein, and fat to the diet, offsetting a reduction in calories from a continuing decline in rice consumption. While the net increase in caloric consumption is expected to be quite modest, changes in the fat-protein-carbohydrate balances will be more significant. Although Japan's consumption of animal protein foods (meats, fish, eggs, dairy products) and fat is still low by western standards, continued growth in their use is a controversial assumption, especially in Japan and given the uneven pattern of consumption change in the 1980's.

Demographic Changes

Japan's population growth is expected to be very slow through the decade (see Box 2), but other kinds of demographic change could be important. A big question is how or if Japanese eating habits will change as a result of aging. Some experts have suggested that some age groups will shift their diet toward the traditional Japanese foods and away from the western foods that they now eat; others say they will keep or expand consumption of western-oriented foods. If they change their diet relatively little, rice consumption is likely to decrease further and meat consumption to grow, because the oldest generation maintains the old rice/fish diet more than the rest of the population. As its numbers decline, rice consumption per person will decrease, and the younger generations, more likely to eat meat, will increase their population share, and meat consumption will go up.

Changes in expenditures on food and in the form and setting in which food is eaten will also continue, and are related to the demographic shifts. Consumption at home and, even more so, food preparation at home are expected to decrease while spending on food away from home and on processed and takeout foods is expected to continue growing. At the same time, expenditures are expected to increase on foods perceived to have higher quality or greater freshness, and on those that add variety to the diet. These changes will make analysis of Japanese food and agriculture more complex, and are difficult to reflect in the projections that are described below. Nevertheless, they are very important to competition for sales and market share in Japan, and thus to U.S. agricultural trade value.

As a result of these trends, there will be a decrease in the share of grains, oilseeds, and other bulk imports in Japan, and an increase in value-added imports, such as livestock products and processed foods, and in high-value imports such as fresh fruits and vegetables, especially those new to consumers.

Policy Changes

Japan seems to be reducing the price subsidies designed to bolster farm household income and to be committed to improving the productivity and competitiveness of its rice agriculture. Some new policies are under consideration and may be adopted, such as a switch away from mandatory diversion of rice area to a voluntary system. Even if the current pattern of small annual reductions in the government rice purchase price persists, cost reductions are likely to be noticeable by 2000.

Policy changes are likely to be incremental rather than abrupt. However, if the more ambitious targets of the current MAFF proposal are met, costs will be only half as high by 2000. Also, an indirect effect could be lower land costs in many rural areas and thus greater opportunity for land uses other than rice farming. This could benefit fruit, vegetable, dairy, and beef enterprises and nonagricultural use of land.

The indirect effects of lower rice costs on trade are hard to quantify and probably minor, given Japan's import barriers.

Indirect effects include lower consumer and processor rice prices, which could boost rice consumption, perhaps at the expense of imported processed rice foods, and lower rental costs for land. These effects are not explored here.

However, since there is external pressure to reduce Japan's trade barriers (e.g., the GATT Uruguay Round), and since such changes would complement efforts to introduce more competition and greater productivity into Japan's agriculture, there is a real likelihood that such barriers will be reduced. In that case, production of rice, wheat, barley, soybeans, sugar, potatoes, pork, and milk would likely be affected by lower prices. Some resources (land, capital and entrepreneurial talent exiting the negatively affected sectors) would become cheaper, benefiting domestic production of fruits, vegetables, and beef. To the extent that some production was made more competitive by reforms, Japanese rice would retain a larger share of the domestic market.

Competition To Supply Japan's Agricultural Needs

A major uncertainty in Japan's agricultural trade is where livestock products will come from: domestic production or imports from overseas. While this has a major impact on the value of trade, relatively small differences in the competitiveness of Japan's domestic production will cause the supplies to shift away from Japanese sources or to them. These differences in costs are too fine to account for in the methods used here. However, the importance of this competitiveness can be illustrated by assuming that Japanese livestock industries keep their current share of the market.

The reasons for the loss of share sustained by the Japanese pork, broiler, and egg industries in the 1980's are not all clear. There was a loss of protection as the tariff on broiler meat imports was reduced and the variable levy on pork fell (as the government's minimum wholesale target price was reduced). Environmental factors may be imposing costs that are relatively greater than the costs imposed on such production overseas. Japan carefully regulates corn imports in order to protect domestic potato starch production, and posts requirements on what ingredients formula feeds should contain. A limited number of feedmills have the exclusive rights to import and mix feed corn. These policies may significantly raise the cost of animal feed in Japan above what a free market would charge. If so, Japan could end the regulations, feed prices would fall, and livestock production would increase.

Agricultural and Trade Prospects to 2000

The base scenario assumes no change in current policies, a specific path of GDP growth, and a particular set of world commodity prices. Little change in current policies is anticipated until the GATT negotiations are successfully completed. The relatively strong income growth assumes a strong rebound from the current economic problems and then a prosperous stability from 1996-2000. The decline in most real world commodity prices assumes continued surplus capacity in agriculture globally. Population growth is fixed at 0.4 percent per year.

Table G-1. Japan: Base projections for meats

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
-----Million tons-----					
---Percent---					
Beef					
Slghtr(Mil hd)	1.28	1.39	1.46	.9	.4
Yield	.34	.40	.41	1.7	.3
Production	.43	.56	.60	2.6	.7
Imports	.18	.61	.95	13.1	4.5
Consumption	.60	1.21	1.64	7.4	3.0
Per cap.(Kg)	5.1	9.4	12.8	6.3	3.1
kcal/day	25	46	62	6.3	3.0
Ending stocks	.04	.15	.08	15.0	-5.6
Pork					
Production	1.43	1.54	1.38	.7	-1.1
Imports	.20	.52	.97	10.0	6.3
Consumption	1.63	2.07	2.35	2.4	1.3
Per cap.(Kg)	13.9	16.7	18.3	1.9	.9
kcal/day	72	87	95	1.9	.9
Ending stocks	.06	.09	.10	5.3	1.1
Poultry					
Production	1.13	1.45	1.33	2.5	-.8
Imports	.08	.31	.66	14.5	7.8
Consumption	1.21	1.76	2.00	3.8	1.3
Per cap.(Kg)	10.4	14.3	15.6	3.2	.9
kcal/day	39	53	57	3.1	.7
Ending stocks	.02	.06	.07	11.2	1.6

Table G-2. Japan: Base projections for milk and eggs

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
-----Million tons-----					
---Percent---					
Milk					
Cows(Mil hd)	1.07	1.08	1.07	.0	-.1
Yield	6.09	7.59	8.10	2.2	.7
Production	6.53	8.17	8.65	2.3	.6
Imports	.00	.00	.00	.0	.0
Consumption	6.53	8.17	8.65	2.3	.6
Eggs					
Production	2.02	2.44	2.55	1.9	.4
Imports	.11	.25	.33	8.8	2.7
Consumption	2.13	2.69	2.88	2.4	.7
Per cap. (Kg)	18.2	21.8	22.4	1.8	.3
kcal/day	70	84	87	1.8	.4
Ending stocks	.00	.03	.03	39.0	1.1

Figure: G-2

Japan: Beef and Veal Supply and Use

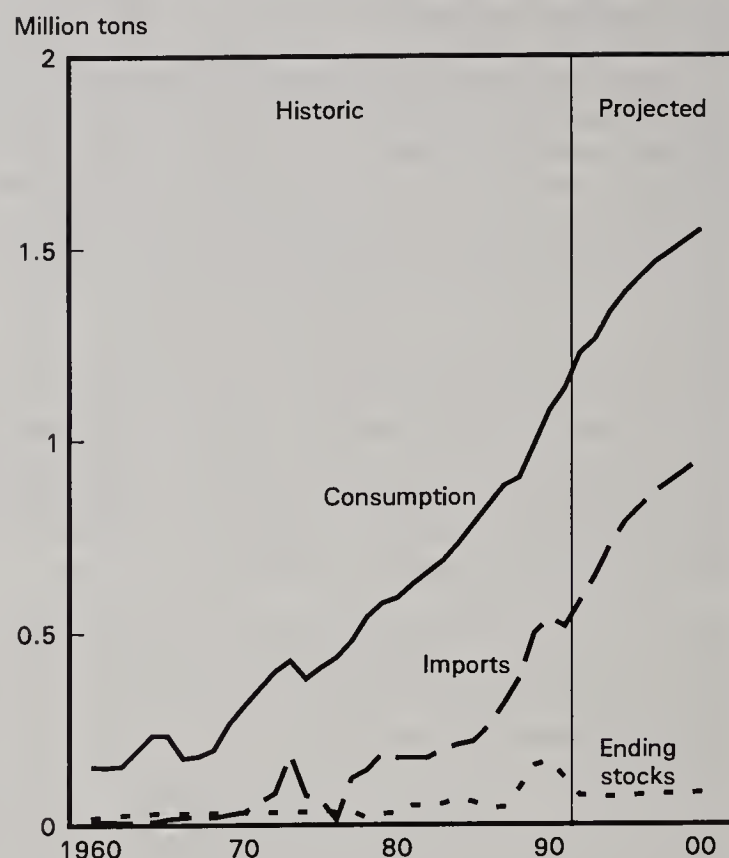


Figure: G-3

Japan: Pork Consumption and Imports

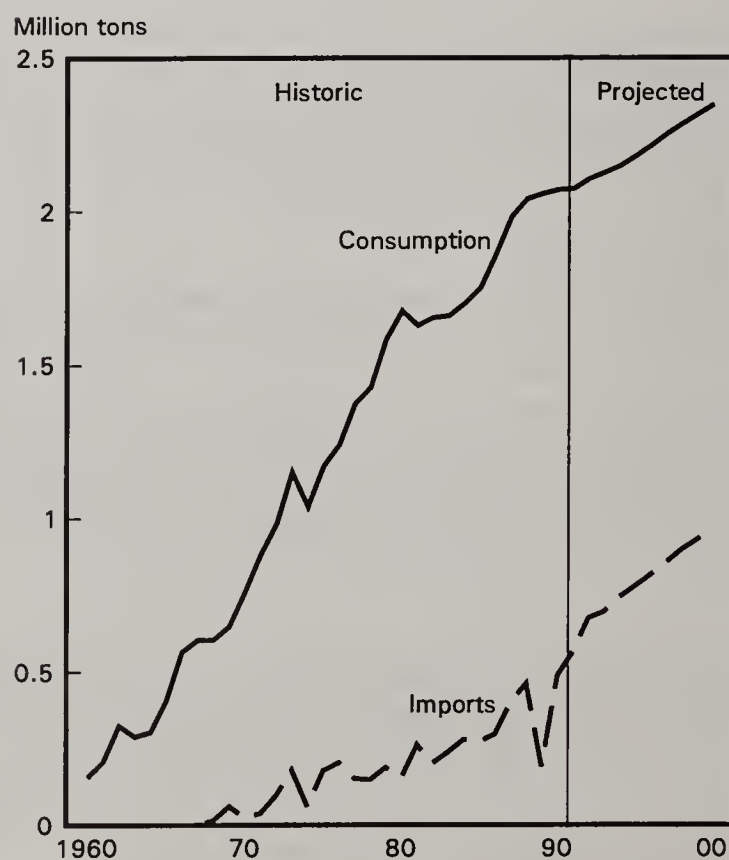
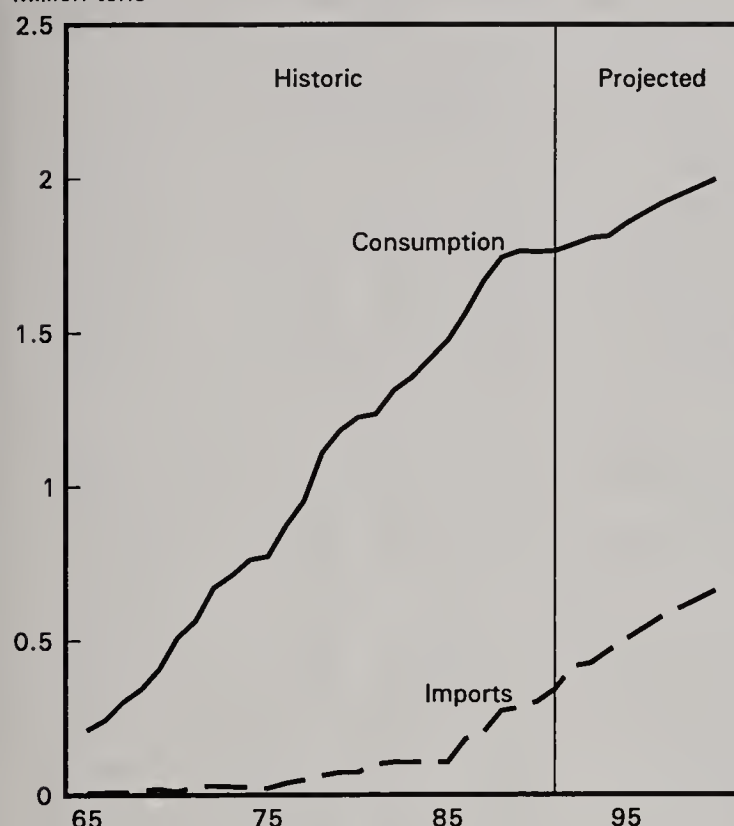


Figure: G-4

Japan: Poultry Consumption and Imports

Million tons

**Livestock Products**

Meat and milk demand are projected to grow, but at a slower rate than in the past (tables G-1 and G-2). Demand for meats, eggs, and milk is determined by the use of income, own-price, and cross-price elasticities that are applied to the income and price changes (see figures G-2 to G-4). The elasticities are estimates from other studies. Those for the meats are reduced at a steady rate over the projection period, because animal protein consumption in Japan may be approaching a level at which future growth will be slower. Annual meat consumption per person rises from about 43 kilograms (carcass weight basis) in 1992 to about 48 kilograms in 2000, an increase of more than 11 percent.

Caloric supply from all animal products is projected to grow by about 6 percent during 1992-2000. This would leave Japan's caloric intake from all animal sources (including fish) still below the current levels in Taiwan and North America.

In the model, livestock product demand is met by a mixture of domestic supply and imports, based on assumed degrees of self-sufficiency for each product in each year. The base scenario assumes that self-sufficiency for most livestock products continues to fall as it did through much of the 1980's.

Herd sizes and composition for the Wagyu, dairy beef, and dairy cow populations reflect the herd structure of 1992 and are adjusted over time so that the size of the dairy cow and beef herds falls slightly and the Wagyu herd remains fairly stable. Dairy numbers fall because milk yield increases and fewer cows are needed for the same amount of milk. Carcass

Table G-3. Japan: Base projections for grains

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Rice					
Area(Mil. ha)	2.38	2.07	2.03	-1.4	-.2
Yield(Kg/ha)	4.07	4.46	4.60	.9	.3
Production	9.70	9.24	9.32	-.5	.1
Imports	.05	.02	.02	-10.6	1.6
Exports	.42	.00	.00	-100.0	.0
Consumption	10.28	9.61	9.32	-.7	-.3
Food	10.22	9.61	9.32	-.6	-.3
Per cap.(Kg)	87.3	77.7	72.6	-1.2	-.7
kcal/day	850	757	707	-1.2	-.7
Feed	.06	.00	.00	-28.9	-100.0
Ending stocks	4.17	.77	1.02	-15.5	2.8
Wheat					
Area(Mil. ha)	.19	.26	.25	3.3	-.4
Yield(Kg/ha)	3.03	3.44	3.67	1.3	.6
Production	.57	.90	.92	4.7	.3
Imports	5.67	5.67	5.80	.0	.2
Exports	.14	.36	.36	10.3	-.1
Consumption	6.09	6.17	6.35	.1	.3
Food	5.93	5.78	6.00	-.3	.4
Per cap.(Kg)	50.6	46.8	46.8	-.8	.0
kcal/day	357	330	330	-.8	.0
Feed	.16	.39	.35	9.4	-1.0
Ending stocks	1.61	1.63	1.63	.1	.0
Coarse grains					
Area(Mil. ha)	.13	.11	.12	-1.5	.6
Yield(Kg/ha)	3.21	3.12	3.37	-.3	.8
Production	.41	.34	.39	-1.8	1.4
Imports	18.69	21.51	21.16	1.4	-.2
Exports	.00	.00	.00	.0	.0
Consumption	19.23	21.75	21.55	1.2	-.1
Food	3.09	3.76	4.33	2.0	1.4
Per cap.(Kg)	26.4	30.4	33.7	1.4	1.0
Feed	16.15	18.00	17.22	1.1	-.4
Ending stocks	2.35	2.76	2.54	1.6	-.8

Figure: G-5

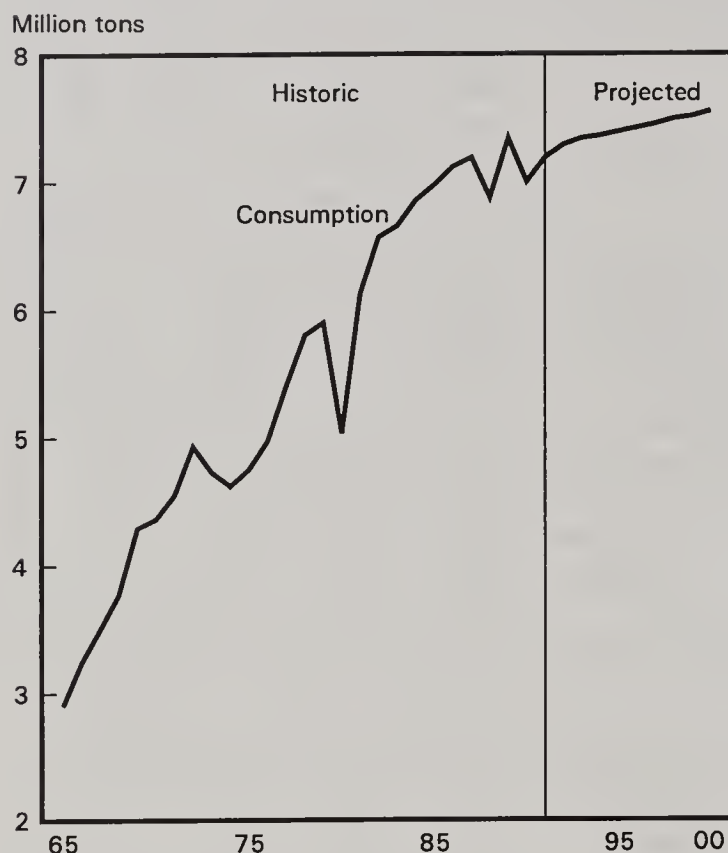
Japan: Oilseed Consumption

Figure: G-6

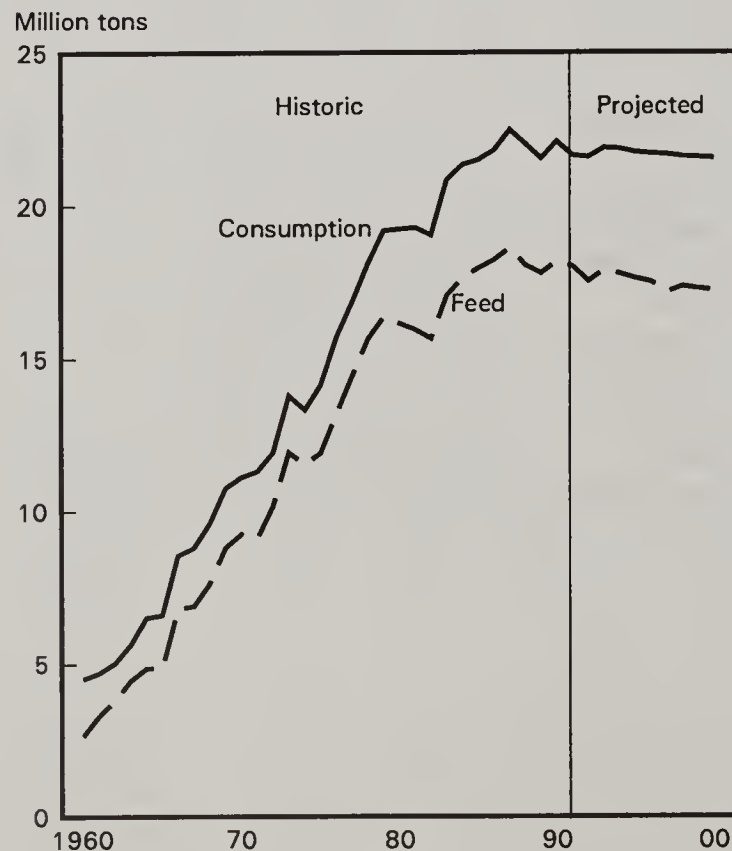
Japan: Coarse Grain Consumption and Feed

Table G-4. Japan: Base projections for oilseeds

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
-----Million tons-----					
---Percent---					
Oilseeds					
Area (Mil. ha)	.17	.16	.17	-.5	.6
Yield (Kg)	1.49	1.62	1.70	.8	.4
Production	.26	.27	.30	.3	1.0
Imports	5.81	6.82	7.27	1.6	.6
Consumption	6.02	7.17	7.55	1.8	.5
Food	.93	1.05	1.11	1.2	.6
Per cap.(Kg)	7.9	8.5	8.6	.7	.2
Feed/seed/wst	.21	.51	.51	9.2	.0
Crush	4.89	5.61	5.93	1.4	.5
Ending stocks	.70	.85	.93	1.9	.9
Soybeans					
Area (Mil. ha)	.14	.15	.15	.4	.5
Yield (Kg)	1.38	1.58	1.66	1.3	.5
Production	.19	.23	.26	1.8	1.0
Imports	4.29	4.51	4.75	.5	.5
Consumption	4.44	4.82	5.01	.8	.4
Food	.79	.91	.95	1.4	.5
Per cap.(Kg)	6.7	7.3	7.4	.9	.1
kcal/day	77	84	86	.9	.2
Feed/seed/wst	.16	.36	.36	8.4	.1
Crush	3.50	3.56	3.69	.2	.4
Ending stocks	.56	.71	.77	2.4	.8
Rapeseed					
Imports	1.15	1.89	2.12	5.1	1.1
Consumption	1.15	1.90	2.12	5.2	1.1
Food	.00	.00	.00	.0	.0
Per cap.(Kg)	.00	.00	.00	.0	.0
Feed/seed/wst	.02	.01	.01	-12.9	.0
Crush	1.12	1.90	2.11	5.4	1.1
Ending stocks	.10	.11	.13	.9	1.5

weights, especially for the Wagyu animals, continue to increase. The upshot is a slight expansion in domestic beef production.

Animal Feed and Vegetable Oils

Given livestock production, fixed feed conversion factors are used to estimate grain and oilseed meal requirements. The conversion factors differ for each livestock type, and are based on recently observed ratios. For animals where there is an apparent trend towards increased feed efficiency, the trend is continued through the 1990's, so that less feed is used per unit of livestock output.

Table G-5. Japan: Base projections for meals

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Total meals 1/					
Production	3.34	3.74	3.89	1.1	.4
Net imports	.22	.83	.77	14.2	-.8
Consumption	3.56	4.56	4.66	2.5	.2
Nonfeed	.66	.74	.75	1.2	.1
Feed	2.89	3.82	3.91	2.8	.2
Ending stocks	.14	.16	.20	1.1	2.4
Rapeseed meal 1/					
Production	.52	.89	.96	5.6	.8
Net imports	.01	.12	.04	33.3	-11.9
Consumption	.52	1.01	.99	7.0	-.2
Nonfeed	.23	.36	.36	4.8	-.2
Feed	.29	.65	.64	8.4	-.2
Ending stocks	.03	.05	.04	3.8	-1.1
Soy meal					
Production	2.73	2.79	2.88	.2	.3
Net imports	.22	.71	.73	12.7	.3
Consumption	2.95	3.49	3.61	1.7	.3
Nonfeed	.43	.37	.39	-1.5	.4
Feed	2.52	3.12	3.23	2.2	.3
Ending stocks	.10	.12	.16	1.5	2.8

1/ Soymeal equivalent.

Vegetable oil demand is determined with elasticity estimates. Oilseed balances (figure G-5) are made assuming that crush will continue until domestic vegetable oil demand is filled, and that oilseed meal needs greater than what the crush provides will be filled by imports. The balance among soybean, rapeseed, and other oilseed products is set to show a continuing, but slower gain in the share going to rapeseed oil and meal. Fish meal supply is assumed to remain at current levels.

Japan's pork and broiler industries have contracted modestly over the last 4 years, and this trend is projected to continue. These industries use about 45 percent of imported feedstuffs, so the feedgrain imported and fed declines over the projection period (table G-3; figure G-6). Oilseed meal use barely rises (tables G-4 and G-5). Since vegetable oil demand is projected to grow, domestic crush and imports of rapeseed and soybeans grow (tables G-4 and G-6). Oilseed meal production rises, but meal imports fall.

Food Grains

Demand for wheat, nonfeed uses of coarse grains, and food use of oilseeds is determined with elasticity estimates. Domestic production is set at a proportion of diverted rice area in addition to a non-diverted area fixed at current levels.

Table G-6. Japan: Base projections for oils

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Vegetable oils					
Production	1.19	1.47	1.59	2.1	.8
Net imports	.26	.42	.50	4.7	1.9
Consumption	1.46	1.88	2.09	2.6	1.0
Food	1.32	1.69	1.88	2.5	1.0
Per cap.(Kg)	11.3	13.7	14.6	1.9	.7
kcal/day	286	346	370	1.9	.7
Industrial	.14	.19	.21	3.6	.8
Ending stocks	.07	.09	.10	3.0	.6
Rapeseed oil					
Production	.46	.76	.87	5.2	1.3
Imports	.02	.00	.00	-12.9	-100.0
Consumption	.47	.77	.83	5.1	.7
Food	.46	.74	.83	4.8	1.2
Per cap.(Kg)	3.9	6.0	6.5	4.2	.8
Industrial	.01	.03	.03	12.7	-.3
Ending stocks	.02	.03	.04	7.5	2.1
Soyoils					
Production	.63	.65	.68	.3	.5
Net imports	.01	.00	.00	-23.2	-100.0
Consumption	.65	.65	.68	.1	.4
Food	.61	.62	.66	.1	.6
Per cap.(Kg)	5.2	5.0	5.1	-.4	.3
Industrial	.04	.02	.02	-5.4	.0
Ending stocks	.01	.02	.02	7.7	-1.4

Wheat consumption per person is expected to remain at current levels, while rice consumption falls by another 5 kilograms per year (table G-3; figures G-7 and G-8). In contrast to declining use in the feed market, demand for coarse grains for starch and other uses is projected to rise by about 6 percent.

Lower rice consumption balances part of the increased caloric intake in livestock products, so that the projections envision an increase in total caloric intake of about 2 percent. Fat and protein intake rise by larger amounts.

Cotton

Raw cotton for spinning into yarn is likely to decline sharply in Japan in the 1990's (table G-7; figure G-9). While textile products containing cotton are likely to maintain current popularity, and even benefit from income growth, those products will increasingly be imported or manufactured from yarn spun or cloth woven outside Japan. Japanese spinners are producing higher-quality yarn, but face increased competition from other sophisticated, well-financed suppliers such as South Korea.

Figure: G-7

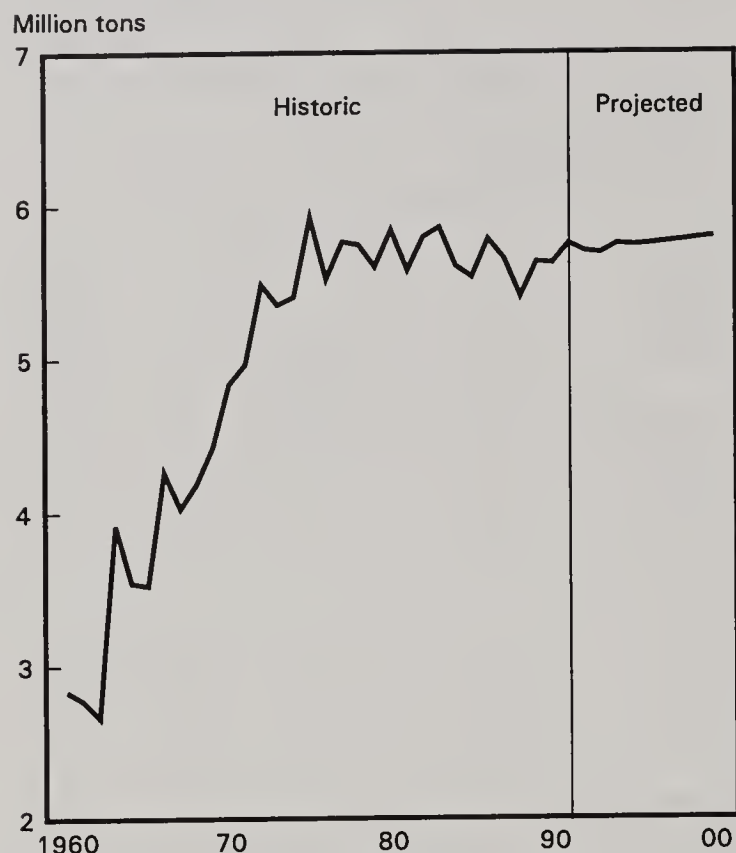
Japan: Wheat Imports

Figure: G-8

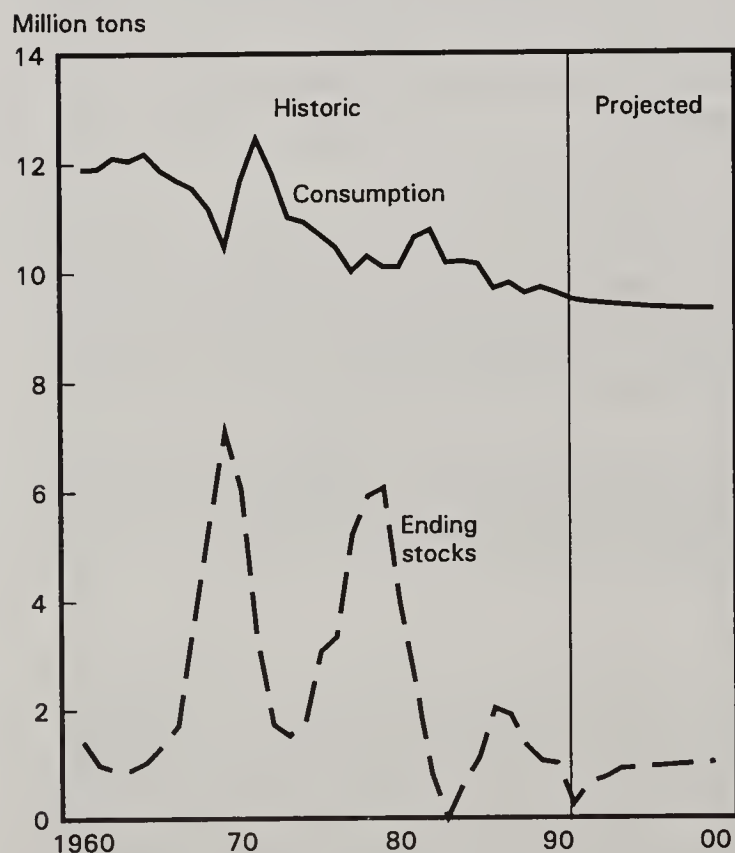
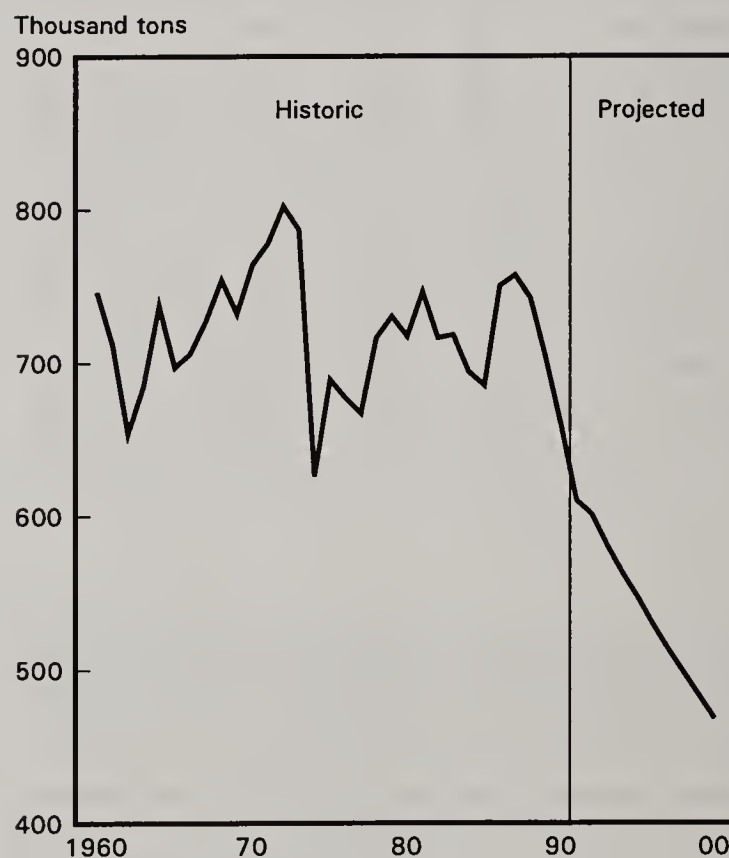
Japan: Rice Consumption and Stocks

Table G-7. Japan: Base projections for cotton

	1979-1981 avg.	1989-1991 avg.	2000	Growth rates	
				1980-90	1992-00
				Percent	Percent
Cotton					
Production	.00	.00	.00	.0	.0
Imports	.73	.65	.47	-1.2	-3.2
Consumption	.73	.66	.47	-1.1	-3.3
Ending stocks	.17	.15	.10	-1.1	-3.8

Figure: G-9

Japan: Cotton Consumption**Alternate Income Growth Scenarios**

Should growth in Japan's economy in the 1990's differ from rates assumed in the base projections, consumption of some of the products covered in these projections could change. Income elasticities are positive for meats, milk, vegetable oil, and some minor commodities. Because demand for feedstuffs and oilseed crushing is derived from these products, income growth also affects demand for feedgrains and oilseeds. The income elasticity for rice is negative, and those for wheat, eggs, and some minor products are set at zero.

Two scenarios test the effect of changes in the rate of growth of the real GDP on the projections: a 1-percent increase and a 1-percent decrease for each year, 1993-2000 (i.e., a GDP

Table G-8. Japan: Results of high-growth scenario

	2000			
	Base	High growth	Change	Change
	--Thousand tons--		Percent	Million \$US
Net imports				
Wheat	5436	5423	-.24	-2.1
Coarse grain	21161	21384	1.05	29.9
Soybeans	4751	4803	1.09	13.8
Rapeseed	2120	2153	1.56	9.2
Other oilseeds	402	404	.50	1.3
Soybean meal	734	729	-.68	-1.1
Rapeseed meal	35	29	-17.14	-.8
Other oil	500	505	1.00	.5
Beef and veal	1040	1124	8.08	233.0
Pork	965	988	2.38	77.5
Poultry meat	661	678	2.57	28.2
Total				389.4

Note: All oilseed meals on a soymeal-equivalent basis.

Table G-9. Japan: Results of pork/broiler constant consumption scenario

	2000			
	Base	Constant consumption	Change	Change
	--Thousand tons--		Percent	Million \$US
Net imports				
Wheat	5436	5424	-.2	-1.9
Coarse grain	21161	20574	-2.8	-78.6
Other oilseeds	402	398	-1.0	-2.7
Soybean meal	734	629	-14.3	-22.3
Rapeseed meal	35	15	-57.1	-2.7
Other meal	5	7	40.0	1.2
Other oil	500	502	.4	.2
Pork	965	892	-7.6	-246.1
Poultry meat	661	609	-7.9	-86.3
Total				-439.2

Note: All oilseed meals on a soymeal-equivalent basis.

growth rate of 3.5 becomes 4.5 or 2.5 for a given year). Table G-8 illustrates the outcome of the higher growth scenario, using net imports. The major change in trade is an increase in meat imports, reflecting increased consumption. The increased meat consumption also adds to demand for domestic meat and milk production, and coarse grain imports and oilseed meal use rise as a result. Vegetable oil demand rises, so that more oilseeds are crushed. This results in smaller oilseed meal imports, despite rising demand for meal, because domestic crush is greater.

Imports of rapeseed and soybeans grow, more than compensating for the decline in meal imports. Wheat net imports fall, although wheat demand remains constant. This is explained by the drop in rice consumption, which causes increased diversion of rice land to wheat, raising domestic production and decreasing imports.

Alternative Livestock Production Scenarios

The base projections for pork and poultry demand growth seem optimistic in view of the experience of the 1980's. To illustrate the effect of a change in demand patterns on the projections, an alternative scenario shows what Japan's trade would be if pork and poultry consumption per person remained at current levels through 2000.

Among the commodity projections, the pork and broiler sectors involve the greatest uncertainty. The reduction in internal, government support to these two sectors in the 1980's coincided with advances in technology and market information that made the shipment of chilled pork and boneless poultry meat to Japan much more viable. These changes, as well as the opportunities for technical advances in the Japanese industry and competitive forces at play among Japanese farmers, triggered a massive change in structure in production during the decade. As a result, it is hard to measure or forecast supply response to future market signals. On the demand side, growth of pork and broiler consumption slowed in the last half of the decade. Changes in the beef market probably reduced pork demand from what it would have been, but it is also possible that the dietary change toward more meat use is slowing.

To illustrate the impact of these uncertainties on the projections, alternative scenarios change assumptions on the supply and the demand for pork and broilers. Table G-9 shows the net trade changes if demand for pork and broilers were to remain at 1992 levels, instead of growing as in the base scenario. In such a case, net imports of pork, poultry, and feedstuffs to support domestic production would fall. The net loss, evaluated at 1991 unit values, would be about \$570 million.

Table G-10 shows a scenario with demand the same as in the base scenario, but domestic pork and broiler production more competitive, so that Japanese self-sufficiency remains at 1992 levels, instead of declining as in the base scenario. Such a scenario is related partly to policy decisions. Japan's feed supply system imposes extra costs on livestock producers by

Table G-10. Japan: Results of pork/broiler self-sufficiency scenario

2000				
	Base	Self-sufficiency	Change	Change
	--Thousand tons--		Percent	Million
Net imports				\$US
Wheat	5436	5460	.4	3.9
Coarse grain	21161	22323	5.5	155.6
Other oilseeds	402	411	2.2	6.0
Soybean meal	734	939	27.9	43.4
Rapeseed meal	35	76	117.1	5.6
Other oil	500	496	-.8	-.4
Pork	965	751	-22.2	-721.4
Poultry meat	661	459	-30.6	-335.3
Total				-842.6

Note: All oilseed meals on a soymeal-equivalent basis.

discouraging competition in the feed input industries and by reducing the choices for onfarm feed formulation. The government also affects producer returns through its influence on wholesale price determination. If Japan's producers become more competitive—for instance, maintaining their share of the market—Japan then will import more feedgrains and soybean and rapeseed meal, and less pork and poultry. In this scenario, the net loss of imports in the year 2000 is over \$800 million, evaluated at 1991 unit values. The value of meat imports replaced by domestic production far outweighs the gain in feedstuff imports.

Implications for U.S. Trade

Japan's agricultural trade has been fairly stable at a very high level, and will continue to be so in the 1990's. Growth in meat demand is expected to continue, benefiting imports, especially of beef. Meat imports are expected to compete

successfully with domestic production, which may decline modestly, thereby reducing Japan's use and imports of coarse grains and oilseed meals.

Japan is increasingly achieving a consensus on the need to reform rice agriculture by introducing more market mechanisms and by consolidating small rice farms. If the reforms succeed, rice production costs will drop significantly in the 1990's. However, unless there is an external stimulus, such as a resolution of the Uruguay Round talks in the GATT or a bilateral negotiation, Japan is unlikely to allow trade in rice. If a decision to trade in rice were made, it would have a major impact on rice prices and production, but probably modest, indirect impacts on trade in other commodities.

Japan's food consumption will continue to evolve, with more animal protein and fat and less rice in the diet. Changes will be slower than in the past, however. Consumption growth of pork and poultry meat has been quite slow recently, but it is difficult to tell whether this is a longer term trend. Similarly, given the rapid structural adjustment that occurred among intensive livestock producers in Japan in the 1980's, it is difficult to predict whether their competitiveness versus imports will improve or continue to decline in the future.

The base scenario relies on Japan's past ability to achieve relatively high growth in GDP. Given the current difficulties that Japan faces, this scenario may be too optimistic. Scenarios showing lower and higher growth rates indicate that a percentage point change in growth is worth about \$400 million in trade in the commodities covered.

U.S. trade has long benefited from Japan's shift to a diet using more livestock products and vegetable oil. For many years, the United States supplied most of the feedstuffs for livestock production in Japan. The scenarios illustrate that the United States benefits even more from providing finished livestock products to Japan. As long as the United States maintains a significant share of Japan's livestock product imports, it will be better off pursuing the higher-valued exports such as meat. Trade in wheat is likely to be quite stable, and to decline in cotton. Overall U.S. export value will rise if the expected decreases in cotton are matched by increases in the livestock trade.

Trends in Asian Demand for Rice and Wheat

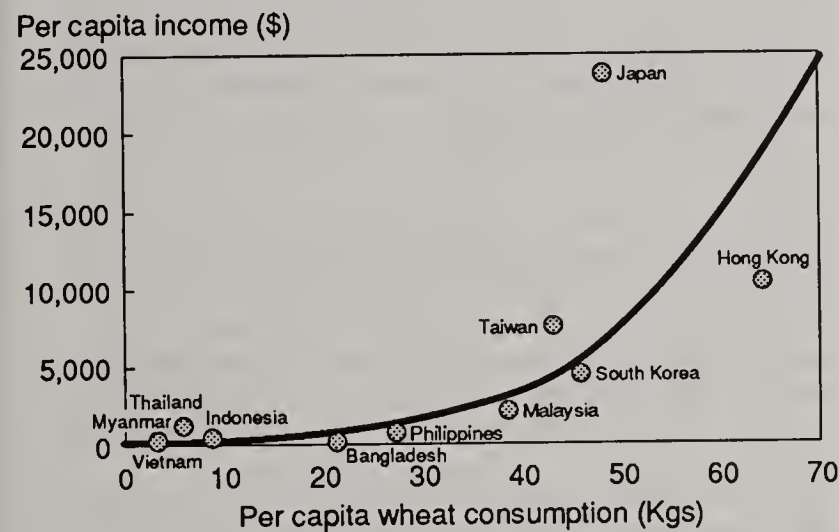
Except among the poorest consumers, rising incomes generally reduce per capita demand for food grains as diets are diversified into other foods, including animal products. In Asia, per capita consumption of rice has tended to either slow or fall in the higher income countries. In the traditional rice-consuming areas of Asia, slower growth in rice demand is typically accompanied by rising demand for wheat. This trend, coupled with continued growth in food grain demand in the lower-income Asian countries, has been important in sustaining U.S. wheat exports. Wheat is the largest U.S. farm export to Asia.

The figures below, based on 1989 data, indicate the strength of the relationship between per capita income and wheat and rice consumption in the traditional rice-consuming countries of Asia. While there is considerable variability across countries associated with the strength of dietary preferences and other factors, the contrasting trends for rice and wheat are apparent. Three major Asian countries where wheat is a traditional staple—China, India, and Pakistan—are excluded from the figures because they do not adhere to this pattern.

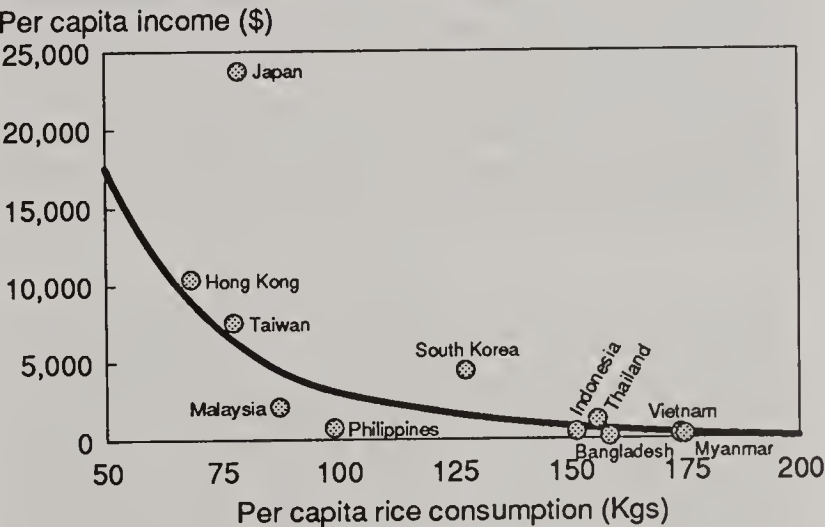
The figures also show the relationship between wheat and rice consumption and the degree of urbanization in the same Asian countries. Urbanization is often cited as a key stimulus to wheat demand, because urban consumers seek a diet which is more diverse and more convenient. The data for Asian countries indicate that urbanization is even more clearly associated than incomes with rising demand for wheat relative to rice.

Selected Asian Countries

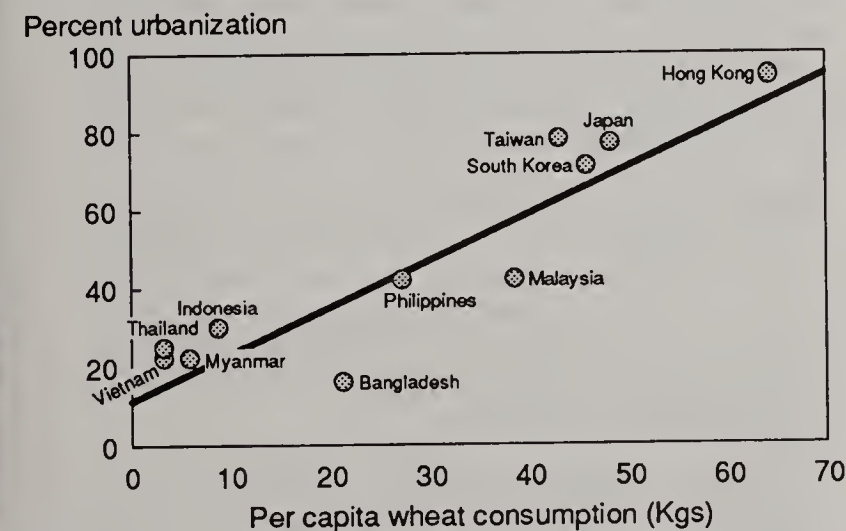
Wheat Consumption versus Income



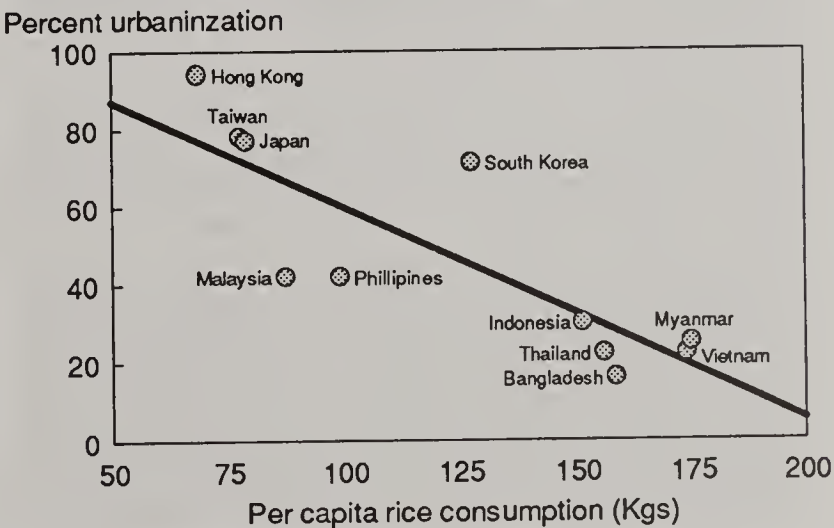
Rice Consumption versus Income



Wheat Consumption versus Urbanization



Rice Consumption versus Urbanization



Malaysia

Mark Giordano

Abstract: Malaysia's dynamic, trade-oriented economy is expected to expand rapidly in the 1990's, driving up demand for imported wheat, rice, corn, and feed protein. Beverages, tobacco, and livestock feeds may offer the best opportunities for boosting U.S. exports. Rising exports of palm oil and poultry are likely to compete with U.S. products.

Keywords: Malaysia, agriculture, policy, trade, wheat, rice, corn, soybeans and meal, meats, oil palm, rubber, cocoa, timber.

Introduction

The Malaysian economy is one of the fastest growing in the world, with per-capita Gross Domestic Product (GDP) growth averaging 4-5 percent annually over the past quarter century and 9 percent in 1989 and 1990. Much of the economic expansion has been predicated on external trade. With exports equaling 83 percent of total output, Malaysia has one of the most export-oriented economies in the world. Economic growth has been sustained through a transition from a raw-commodity export base to producer and exporter of value-added goods. The transition was made possible by liberal trading regimes and government efforts to reduce dependence on a small number of raw commodities.

The agriculture sector in Malaysia, as in most other developing countries, is declining as a proportion of GDP. Nonetheless, it still accounts for approximately 20 percent of domestic output and 28 percent of total employment, and is second only to manufacturing in economic importance. Palm oil recently supplanted rubber as the country's most important agricultural product, and cocoa and fruit production continue to gain prominence. Rice is Malaysia's most important non-perennial crop, however the role of wheat in the diet is increasing as income and urbanization grow. Livestock production and consumption, composed primarily of poultry and pork, are likewise expanding.

Malaysia plays an important role in world agriculture, primarily as an exporter of tree-crop commodities, and is currently the world's largest exporter of palm oil and cocoa, and the second largest exporter of rubber. Alternating with Indonesia, the country is also the largest tropical-timber exporter in the world. Malaysia is Asia's seventh largest importer of agricultural commodities. Imports are composed primarily of cereals for both food and feed use, oilseeds, and other feed-stuffs. For the United States, however, Malaysia is a small market for agricultural exports—U.S. market share is less than 6 percent. The primary U.S. agricultural exports to Malaysia are tobacco, fruits and vegetables, and oilseeds.

Economic Trends and Policies

The impressive 4-5 percent annual growth of the Malaysian economy over the past few decades resulted in 1990 per capita income of \$2,320 as compared with \$1,420 in Thailand and

\$550 in Indonesia. Malaysia's long-term economic success is based on its ability to transform from resource-extraction and estate-agriculture dependency to export-oriented manufacturing. Economic growth has not, however, been without its problems. First, Malaysia has experienced periodic economic downturns, most recently in 1985-86, partly as a result of its dependence on global economic conditions. Second, Malaysian affluence has not accrued equally across the country. Poverty still exists in some areas, particularly in rural Sabah and Sarawak, though the government is increasing programs in those areas.

High inflation is another problem frequently associated with rapid economic growth. Malaysia mitigated inflation by increasing productivity and domestic capacity through trade policy liberalization and infrastructure investment. As a result, inflation averaged only 2.6 percent per year from 1979 to 1989. Price stability has also been maintained through prudent fiscal and monetary policy.

The government recognizes the leading role of the private sector in economic growth and believes the private sector performs best under stable macroeconomic conditions. The government therefore has attempted to direct its monetary and fiscal policy towards price and exchange rate stability and maintaining a healthy balance-of-payments position. This is evident in relatively low budget deficits, averaging 4.4 percent of GDP during 1985-89, and a money supply that expanded only about 4 percent faster than GDP during the same period.

Economic resilience has been further helped by high levels of private savings and investment. The largest recipients of private investment have been the petroleum, manufacturing, and service sectors. Public investment also increased recently as the government attempted to reduce transportation and power supply bottlenecks resulting from the rapid growth following the 1985-86 recession.

The government perceives a limited economic role for itself in the future and plans to consolidate activities and reduce intervention in the private sector. Plans are underway to further deregulate investment and improve administrative procedures at all levels of government. Though regulatory bodies such as the Ministry of International Trade and Industry, the Foreign Investment Committee, and the Capital Issues Com-

mittee will continue to function, their procedures are to be further rationalized. The government does, however, see a role for itself in helping to ensure continued development by working to maintain national competitiveness. By limiting its role in micro management and regulation, the government hopes to devote more resources to research and development, education, and infrastructural improvements.

Trade Performance and Policies

Malaysian imports and exports increased 32 percent and 20 percent, respectively, in 1991. Despite the change in the merchandise account from its traditional surplus position, the current account remains strongly in surplus. Japan and the United States are Malaysia's largest trading partners. Singapore is also a major market for Malaysian exports, though largely as an entrepôt. Malaysia's primary exports include electrical and electronic machinery, petroleum and natural gas, palm oil, rubber, saw logs, and textiles. Imports include machinery and transportation equipment purchased primarily from the U.S. and Japan, manufactured goods purchased predominately from Japan, and food. Malaysia's food imports originate mainly in Australia and Thailand.

The Malaysian economy is one of the most trade-oriented in the world. Growth in imports and exports exceed the expansion rate of the economy as a whole. Trade growth has been facilitated by exchange rate stability and prudent fiscal and monetary policies, both attributable to Malaysia's political stability. Over the past 5 years, the current account has remained largely in balance, with a merchandise trade surplus offset by investment inflows.

The government views its dependence on industrialized nations as purchasers of Malaysia primary products as a major economic risk. The risk from Malaysia's standpoint is two-fold. First, economic stagnation in the industrialized world decreases import demand for Malaysian products. Second, protectionist measures periodically entertained in the developed world directly threaten the trade-dependent Malaysian economy. As a result, the government has been supportive of trade liberalization efforts under the auspices of the General Agreement on Tariffs and Trade (GATT), Association of Southeast Asian Nations (ASEAN) and other multi- and bilateral bodies and has unilaterally maintained relatively liberal trade regimes. Barriers that do exist are primarily designed to promote exports of value-added products over unprocessed commodities or to encourage domestic processing of imported commodities.

Agricultural Trends and Policies

Rubber has traditionally been Malaysia's primary agricultural output, and until recently Malaysia was the largest exporter of natural rubber in the world. However, diversification efforts to limit single crop dependency and changes in cost structures have made palm oil the single most important agricultural product. Rice is Malaysia's most important non-perennial crop and receives the highest level of government intervention of any major agricultural commodity.

Wheat consumption, met entirely by imports, continues to increase, due largely to taste changes associated with rising incomes and increased urbanization. Livestock production and consumption, primarily poultry and pork, are also growing rapidly, and Malaysia is now a net exporter of both products. However, concerns over pollution and religious sensitivity among the Muslim population have prompted policies to curb further increases in pork output. Domestic beef and milk production continue to meet only a fraction of domestic demand, though programs to improve stock quality and veterinary services have been increased in recent years.

In agriculture, the overriding concerns of the government are land scarcity, labor shortages, and increasing production costs. These problems are to be addressed through land consolidation and reorganization of smallholdings, increased extension work, and improved marketing services. Direct government expenditures on agriculture over the past 5 years averaged \$1.5 billion, or about 10 percent of the value of all agricultural output. The government plans to continue expenditures at this level at least through the next 5-year plan.

The primary impacts of direct intervention have been yield growth and altered planting patterns. Some investment in transportation infrastructure will also be targeted at agriculture, especially in Sabah and Sarawak where land availability is less a problem than transportation. In line with the National Forest Policy, much greater emphasis is to be given to forest conservation and environmental balance. Logging rates are to be reduced to sustainable levels while reforestation efforts on logged-over land are increased.

Tree Crops Dominate Production

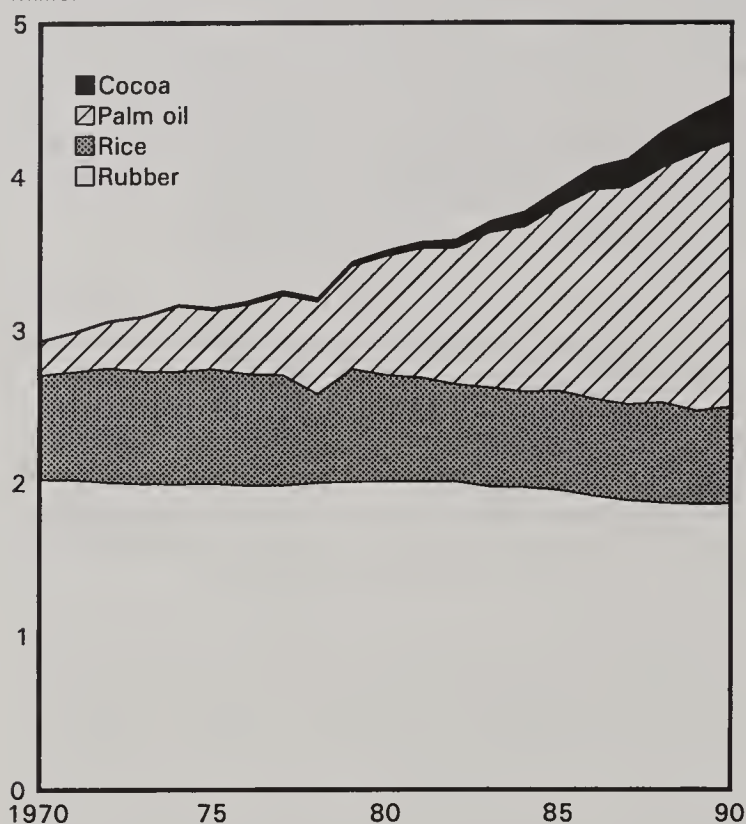
Malaysia's agricultural export earnings are dominated by tree crop products, specifically rubber, palm oil and, increasingly, cocoa. Tree crops, typified by their long economic life, normally do not begin producing until their third year and may be efficiently productive until 20 to 30 years of age, with yields peaking around 10 years. Three main trends are now visible within the Malaysian tree-crop sector. First, yields are increasing due to the introduction of high-yielding clones. Second, increases in the total area under tree crops is slowing as suitable land becomes more costly to develop and forest management becomes a higher priority. Third, more emphasis is being placed on palm oil and cocoa production, while planted area in the traditional rubber sector is declining (figure H-1).

Government intervention in the Malaysian tree crop sector takes myriad forms. Development authorities at the national level, either independently or in cooperation with small holders, develop land within broad tree-crop production plans. Such authorities include the Rubber Industry Smallholder's Development Authority (RISDA), the Federal Land Development Authority (FELDA), and the Federal Land Consolidation and Rehabilitation Authority (FELCRA). Within these development schemes, the government is able to direct investment flows. Other forms of intervention include replanting subsidies used to alter the relative return of a specie, fertilizer and pesticide subsidies, and basic productivity and genetic research.

Figure H-1

Malaysia: Area Devoted to Tree Crops

Million hectares



Source: Government of Malaysia

Rubber. Rubber has traditionally dominated Malaysian tree-crop production and exports. Until 1991, Malaysia was the world's largest producer and exporter of natural rubber. The importance of rubber in the domestic economy and its dominance of international trade has, however, declined since the early 1970's. Externally, production in competing countries, particularly in Thailand and Indonesia, has increased rapidly. Internally, changes in government policy encouraged rubber producers to diversify production, in part to reduce international price risk. These changes have resulted in a shift out of rubber on large estates, while area devoted to rubber on small holdings has remained nearly constant. Reasons for the divergence include differential government policies with respect to farm size and differing production technologies. As a result, area planted in rubber has consistently declined over the past 15 years, though decreases in total area have been offset to some degree by increases in plantings of high-yielding clones.

Labor costs, which make up 50 percent of the production costs, are an additional problem for Malaysian rubber producers. As wages rose in the mid-1970's, it became increasingly difficult to attract sufficient workers for the labor-intensive harvest of rubber, a problem further compounded as rural labor relocated to cities. Because of higher labor costs, less productive trees frequently remained untapped when output prices are sufficiently low. There is some possibility for change with the advent of increasingly successful automated tapping technologies.

Palm Oil. Production has been encouraged by the government, and the area devoted to palm oil has consumed the majority of the land removed from rubber production, in addition to new land developed for tree crops. Malaysia is now easily the world's largest producer and exporter of palm oil. Reasons for government emphasis on palm oil include plantation diversification, farm income stabilization, compatibility with industrial needs, and increasing domestic value added.

Palm oil production has risen from 0.6 million tons in 1970 to over 6 million tons in 1990 and surpassed the volume of rubber output by the mid-1970's. Government support, such as replanting bonuses, developing high-yield clones, and subsidizing inputs, have been supplemented by market factors including lower relative labor requirements and production costs and changes in international prices.

Important palm oil importers have included the European Community, China, Pakistan, and India. The developing world in general, and Asia in particular, will likely increase their role as palm oil importers as incomes continue to rise. Malaysian palm oil has competed well in rapidly expanding South Asian markets because of taste preferences as well as price and freight rate advantages. In recognition of Malaysia's increasingly dominant role in production, the government has promoted palm oil consumption in world markets via trade delegations and industry shows.

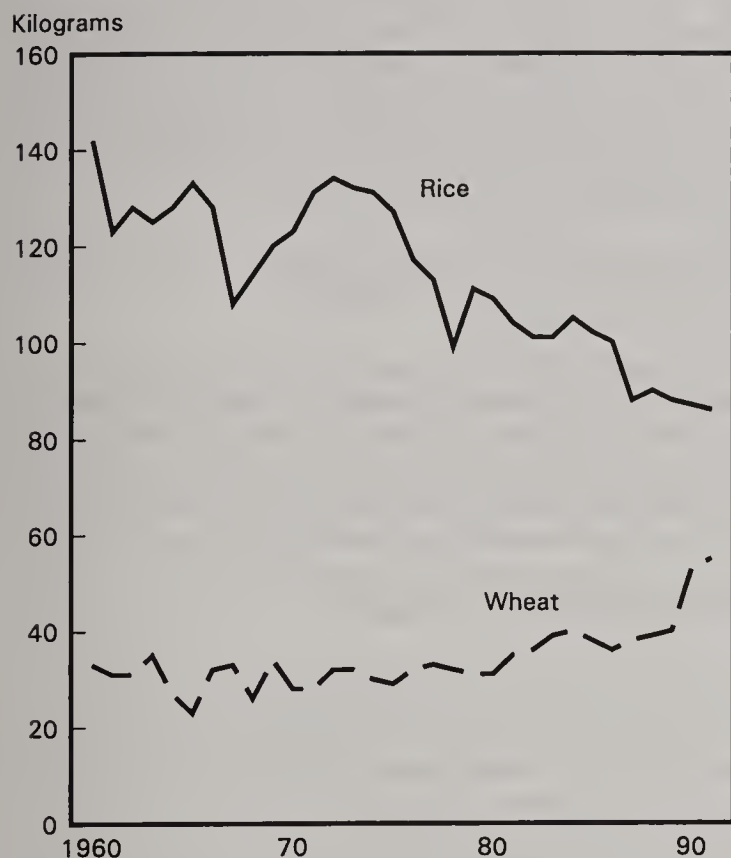
Cocoa. Major cocoa production in Malaysia began in the mid-1970's and, though the land area used by cocoa remains small relative to other tree crops, Malaysia is already the world's third largest producer. The high cocoa prices of the 1970's encouraged plantings that received further support through subsidies under the Coconut Replanting and Rehabilitation Scheme (cocoa is frequently intercropped with coconut) and through input subsidies under the Agriculture Inputs and Diversification Scheme.

High prices also induced expansion of cocoa production in other countries, concurrent with marginal increases in world demand. The ensuing decline in world cocoa prices decreased Malaysian plantings and crop maintenance, though increases in productivity and output continue with the maturation of higher yielding varieties and better management practices. In 1990, for instance, yields averaged 1,052 kilograms per hectare, up from 659 kilograms in 1985. In efforts to encourage processing of domestic cocoa beans, the government has imposed import taxes on externally produced cocoa beans, while exports of cocoa products produced from domestic beans are duty free.

Food Grain Use and Policies Change

Rice is the mainstay of the Malaysian diet and the commodity most subjected to direct government policy intervention. The role of rice in consumption and government policy towards it is, however, transforming with the development of the economy. Intervention in rice markets began immediately following independence from Britain in 1957, principally due to explicit rice self-sufficiency goals. Rice production increased rapidly until 1974 as a result of the introduction of

Figure H-2

Malaysia: Per Capita Grain Consumption

high-yielding rices and improvements in the irrigation and transportation infrastructure. In addition, production was boosted by government support in the forms of free fertilizer, seeds, irrigation water, low-interest production loans, and subsidized pesticides. Since 1974, rice production and government support have declined.

Though substantial subsidies remain, their levels have generally decreased, contributing to declines in area planted and flat-to-negative output growth after 1974. Labor migration to higher-paying manufacturing jobs has contributed to the reduction in rice area. The government appears willing to allow resources to continue flowing out of the rice sector in recognition of the limited comparative advantage in production. The change in rice policy stems from the desire to rationalize agricultural investment, given the declining role of rice in the diet. Priority is now given to export-oriented perennial crops that have greater potential for domestic value added.

As rice consumption has fallen, wheat consumption has risen to take its place and now accounts for 24 percent of total food grain intake (figure H-2). Malaysia's tropical climate is not conducive to wheat production, so virtually all wheat is imported. In keeping with the general policy of encouraging domestic value added, the government only permits imports of unprocessed grain. Wheat imports began to show substantial growth in 1970 and reached 850,000 tons in 1991, with Australia the major supplier. Though still used primarily for human consumption, wheat is also used as a feed when its price is low relative to feed grains, as was the case in 1990 and 1991.

Malaysia has historically used administered prices, both to support domestic rice producers and to allocate rice and wheat to consumers. Official rice prices have remained unchanged since the early 1980's. The National Padi and Rice Board (LPN) purchases padi from farmers at relatively high administered prices and has the sole authority to import rice. Less than half of total production was purchased by LPN in recent years because of limited milling capacity. The rest was traded in the open market.

Consumer prices are controlled under the Essential Regulations of 1974 and not directly linked to producer prices. The government has traditionally delivered sufficient quantities of rice to clear markets at prevailing State prices by importing shortfalls. Rice imports, averaging approximately 330,000 tons per year over the past 5 years, have come primarily from Thailand and China. Consumer prices for wheat flour are also controlled, through a system that links domestic prices to the price of Australian and U.S. white wheats.

Feed-Livestock Sector Expands Rapidly

Malaysian livestock production has expanded rapidly in recent years. The industry is driven largely by changes in meat demand associated with rapid increases in income and changing tastes, a pattern not dissimilar to other industrialized and newly industrializing nations. Production is centered on poultry and pork, although considerable policy emphasis has been given to the beef and dairy sectors in order to decrease import dependence.

Livestock production takes place under two highly divergent processes, non-intensive yard or small farm operations and highly intensive modern feed lots. Though the majority of livestock production is consumed domestically, rapid expansion has made Malaysia a net exporter of livestock products, primarily poultry. Recent efforts have been undertaken to find foreign markets capable of absorbing continued growth.

Poultry output showed phenomenal growth in the 1980's due in part to the establishment of modern production facilities. With success in increasing poultry production, future gains will be increasingly affected by import demand from other Asian nations. Pork production has also benefited from new, feedlot-style production. However, because of the high percentage of Muslims in the population and environmental considerations, official policy is to limit future production to domestic consumption needs and locate pork facilities in remote areas.

While, to date, poultry and pork development has been relatively unencumbered by government action, the dairy and cattle industries have increasingly received preferential treatment. The government has encouraged production through subsidies on animals sold to farmers, establishment of milk collection centers, and enhancement of breeding stock through research and imports. The government has cited the high cost of imported feed, amounting to 60 percent of the production cost, and the subsidized exports offered in world markets as principal impediments to development of the beef and dairy industry. Though the industry has responded to supportive policies, resulting in decreased dependence on dairy and beef

imports, the sector as a whole remains relatively small and continues to play only a minimal role in feed demand.

The rapid increase in livestock production since the 1970's has caused an equally rapid increase in feed grain imports. Some efforts have been made to improve maize varieties for commercially viable production, and research has been conducted on further uses of tree crop byproducts. However, such efforts will only meet a small portion of feed needs in the foreseeable future.

Malaysia's principal feed grain imports are corn, soybeans and, occasionally, wheat. The introduction of soy processing facilities in 1978 and subsequent growth of the processing industry has reduced soy meal imports in favor of soybeans. If the Malaysian flour and cocoa industries can be taken as models, one would expect continued government emphasis on domestic processing in an effort to increase value added. Such emphases have traditionally included differential duties on processed and unprocessed products and trade restrictions on processed products.

Forestry and Forest Product Policies Undergo Change

Malaysia, with a climate ideally suited for the production of tropical timber, remains the world's largest hardwood exporter, contributing 13 and 24 percent, respectively, of the world's hardwood log and sawn timber trade. In addition to its role in global trade, timber is a significant element in the export-oriented economy, generating \$7.1 billion, or 8.9 percent of total 1990 export revenue. Growth in log production averaged 4.4 percent per annum from 1965 through 1990. The forestry sector is, however, undergoing a series of changes due to internal and external pressures.

The major impetus for change is the inability to sustain current deforestation rates. Environmental groups both inside and outside of Malaysia and the government have recognized that the logging rates of the past two to three decades have exceeded those sustainable on a long-term basis. If current levels are maintained, Malaysia's forests would likely be fully depleted in the mid-21st century. Though a scenario of complete deforestation is wholly unrealistic, it brings to light the fact that changes will occur in the timber sector, either as a matter of explicit policy or due to a physical lack of trees.

For agriculture, the main impact of forest policy will be on the availability of new land. To the extent that policy is successful in limiting forest clearings and establishing sustainable tree harvests, less land will be available for new tree-crop plantings. The impacts of any current changes in forest-management policy on tree-crop output during the 1990's will, however, be very limited because of the long-time horizon associated with tree crop production. Most of the tree-crop area that will significantly affect production in the 1990's has already been planted. Nonetheless, new land availability will be increasingly constrained and output growth will be increasingly dependent on enhanced productivity.

In addition to pressures concerning logged area, other forces are arising regarding log utilization. Logs were typically

exported whole, but the percentage of logs exported without additional processing has declined since the mid-1970's. As current efforts to boost domestic employment and expand downstream processing of primary commodities increase, a growing percentage of logs are manufactured into moldings, plywood, and furniture before export. National and State government policies that promote processing, along with new technologies to reduce high levels of waste, will help maintain export revenues at lower extraction levels.

Issues Affecting Agricultural Trade in the 1990's

Malaysian agricultural production and trade will depend on a number of key factors over the next decade. Foremost among these are the rate of economic growth and the policy environment for agricultural production and trade. Projections of agricultural trade trends in the 1990's will likely be highly sensitive to assumptions made about these variables.

Income and Population Growth

Per capita income growth is critical in determining the composition and volume of both production and trade in Malaysia. Rising incomes are correlated with shifts from rice to wheat consumption, the increasing importance of livestock products in the diet, and the demand for feeds. For the base projections, the Malaysian economy is assumed to grow 7-8 percent annually, driven by further diversification of manufacturing exports, an increased orientation towards expanding Asian markets, and an improved policy environment for private domestic and foreign investment. Due to the economy's high dependence on trade, key factors in sustaining growth include the expansion of world demand, the openness of the global trading system, and the willingness of the government to maintain a liberal trading regime.

Malaysian economic growth has occurred in an environment of stable and complementary monetary, fiscal, and exchange rate policy, contributing to generally low rates of inflation. With government emphasis on a stable and predictable investment climate, combined with public sector investment aimed at reducing infrastructural constraints to growth, inflation is expected to remain in the 4-6 percent range. Population growth is currently 2.4 percent annually and is assumed to fall to 2.2 percent annually by 2000, a result of improved family planning and income growth.

Trade and Exchange Rate Policy

Commercial policy is, and is likely to remain, relatively liberal, with few constraints and low tariffs on most imports and exports. The most prominent forms of intervention are likely to be measures to promote exports of value-added vs. unprocessed items and to encourage domestic processing of imported bulk commodities. The real value of the ringgit is expected to be relatively firm against the dollar over the projection period. Key factors are the relative strength of Malaysia's balance of payments, prudent monetary and fiscal policies by the government, and an increasing orientation towards trade with Asian countries.

Domestic Agricultural Policy

Domestic production policies can play a major role in Malaysian agriculture. Rice support programs, for instance, had a major impact in expanding output. However, changing demand conditions alter the opportunity costs of maintaining programs and, in the case of rice, support has been reduced as a result. Policies will continue to evolve for other reasons. For example, as knowledge of environmental conditions changes, the agricultural use of currently forested land will likely become more restricted.

For the projections, it is assumed that rice price support programs will remain at current levels, implying declining real protection as world prices decline, and that tree-crop policy will continue to encourage diversification in line with past efforts, implying moderate increases in palm oil, cocoa, and fruit area and a decline in the area devoted to rubber. The most probable potential change from these assumptions is that rice support programs will be reduced more rapidly than is assumed here.

Foreign Trade Environment

Because of the Malaysian economy's high dependence on trade and the large share of agriculture in total exports (20 percent), foreign agricultural policies play a major role in both economic growth and agricultural production. It is assumed that most policies of importing countries will remain unchanged over the projection period. In particular, it is assumed import policies with respect to G-7 rubber trade and European sawn timber trade will remain unchanged.

Income growth outside of Malaysia, particularly in the developed world and increasingly throughout Asia, will also be critical for Malaysian agriculture. Despite efforts to reduce single-crop dependency, exports of most Malaysian agricultural commodities are still highly correlated with prosperity in importing nations. As a result, export earnings, incomes, investment and import demand are heavily determined by Asian and global economic performance (Box 1).

Agricultural and Trade Prospects to 2000

The assumptions outlined above were incorporated in the base scenario projections which are described below and summarized in Tables H-1 to H-3. The base projections represent the most likely scenario of events through the year 2000. After analyzing the base results, their sensitivity to alternative assumptions on key variables is examined.

Food Grains

Food grain consumption patterns in Malaysia are changing with rising incomes and increased urbanization. As a result, annual per capita rice consumption has declined from 132 kilograms in 1974 to 88 kilograms in 1989 while wheat consumption has risen from 30 kilograms to 40 kilograms. With continued income growth and urbanization, food grain consumption is projected to follow past trends, though at a slightly slower rates (table H-1). As a result, per capita rice consumption is projected to decline 1.5 percent annually in

Table H-1. Malaysia: Base projections for crops

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Thousand tons-----			---Percent---	
Wheat					
Imports	466	930	1448	7.2	4.5
Exports	15	65	65	15.8	.0
Consumption	440	867	1081	7.0	2.2
Food	420	727	1012	5.6	3.4
Per cap.(Kg)	32	41	46	2.6	1.1
Feed	20	140	68	21.5	-7.0
Rice					
Area (Ths. ha)	704	632	619	-1.1	-.2
Yield (Kg/ha)	2	2	2	.3	.2
Production	1251	1152	1153	-.8	.0
Imports	241	374	485	4.5	2.6
Consumption	1488	1523	1636	.2	.7
Food	1488	1523	1636	.2	.7
Per cap.(Kg)	108	87	75	-2.2	-1.5
Corn					
Area (Ths. ha)	14	20	26	3.6	2.7
Yield (Kg/ha)	1	2	2	2.1	.4
Production	20	35	47	5.8	3.0
Imports	711	1504	2721	7.8	6.1
Consumption	731	1533	2754	7.7	6.0
Per cap.(Kg)	53	87	126	5.1	3.7
Food	23	66	82	11.1	2.2
Feed	708	1467	2672	7.6	6.2
Rubber					
Area (Ths. ha)	N/A	1835	1734	N/A	-.6
Yield (Kg/ha)	N/A	1	1	N/A	.9
Production	1537	1319	1361	-1.5	.3
Exports	1537	1319	1361	-1.5	.3
Cocoa					
Area (Ths. ha)	N/A	289	387	N/A	3.0
Yield (Kg/ha)	N/A	1	1	N/A	1.4
Production	35	240	366	21.2	4.3
Exports	32	181	356	18.8	7.0
Consumption	3	6	9	7.2	4.1

Source: USDA and Government of Malaysia

the 1990's. Per capita wheat consumption, on the other hand, is projected to rise 1.1 percent annually.

Because of the declining importance of rice in the diet and the high opportunity costs of maintaining rice self-sufficiency targets, the government has consolidated its rice production

Table H-2. Malaysia: Base projections for livestock

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
	-----Thousand tons-----			---Percent---	
Poultry					
Production	N/A	349	715	N/A	7.4
Imports	N/A	9	7	N/A	-2.5
Exports	N/A	17	79	N/A	16.6
Consumption	N/A	341	644	N/A	6.6
Per cap.	N/A	19	29	N/A	4.2
Grain fed	N/A	423	867	N/A	7.4
Oilmeal fed	N/A	181	371	N/A	7.4
Pork					
Production	179	202	294	1.2	3.8
Imports	5	0	0	N/A	.0
Exports	N/A	16	16	N/A	.0
Consumption	N/A	186	278	N/A	4.1
Per cap.	N/A	11	13	N/A	1.8
Grain fed	607	687	998	1.2	3.8
Oilmeal fed	152	172	250	1.2	3.8

Source: USDA and Government of Malaysia

programs. Rice production is now increasingly located only on land best suited for its production. The total area devoted to rice has therefore declined. However, average yields have risen as marginal lands have been taken out of production and irrigation and input availability has increased. In recent years, this combination of factors has resulted in a stagnation of production.

It is expected that relatively little change in rice production will take place to 2000 as further removal of uncompetitive land from production is offset by increases in yields as irrigation, more efficient production techniques, and improved seed varieties are introduced. The government's stated unwillingness to rely completely on imports will also keep change to a minimum.

The supply and demand forecasts imply a 30 percent rise in rice imports over the projection period. As Malaysia produces no wheat, imports will grow with consumption, rising 56 percent by 2000. The key assumptions behind these projections are that rice will continue to become relatively less important in the Malaysian diet and that the government will not reintroduce rice self-sufficiency as a policy.

Livestock and Feed

Pork and poultry production are projected to expand at 3.8 percent and 7.4 percent annually, rates somewhat below those of the past decade (table H-2). The driving force behind the expansion in production is domestic income growth. However, in the case of poultry, foreign demand will become

Table H-3. Malaysia: Base projections for oilseeds and products

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg. 1/	avg.			
	-----Thousand tons-----			---Percent---	
Oilseeds					
Area	1,503	2,002	2,427	3.6	1.9
Yield	.89	.99	1.08	1.3	.9
Production	1,340	1,981	2,631	5.0	2.9
Imports	216	542	1,242	12.2	8.6
Exports	32	43	0	3.8	-100.0
Consumption	1,508	2,489	3,864	6.5	4.5
Crush	1,452	2,384	3,715	6.4	4.5
Oilmeals					
Production	519	1,410	2,339	10.5	5.2
Imports	147	199	271	3.1	3.1
Exports	275	977	1,564	13.5	4.8
Consumption	275	600	1,064	8.1	5.9
			1,293		
Oils					
Production	3,263	7,186	9,800	8.2	3.2
Imports	6	189	107	41.2	-5.5
Exports	2,750	6,306	8,100	8.7	2.5
Consumption	477	1,082	1,807	8.5	5.3

1/ 1982-84 for Oilseeds

increasingly important. Poultry exports are assumed to grow 17 percent per year, following the Thai pattern of a decade ago. Pork exports are assumed to be negligible as a result of government policies to limit production to domestic need.

The key variables in the livestock projections are the competitiveness of Malaysian poultry producers vis-a-vis those of other exporting nations such as Thailand, coupled with global and Asian market expansion. Thailand's comparative advantage in poultry production, attributable to domestic feed availability, is waning for marginal production as additional feed requirements must increasingly be met through imports. Therefore, Malaysia's ability to compete in export markets may improve, particularly with continued investment in efficient modern broiler operations.

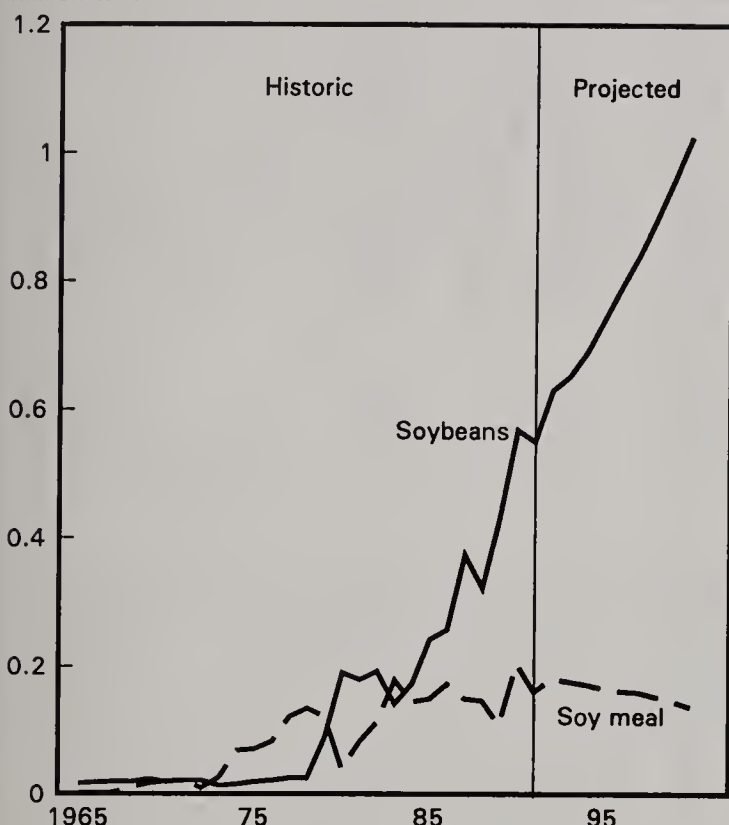
Grain and protein demand for livestock feeds are projected to rise with the growth of the livestock industry. Corn is the dominant grain used in livestock feeds. Corn demand and imports are projected to nearly double, rising 6.1 percent annually to 2.7 million tons in 2000.

Malaysia currently meets its feed protein requirements through oil palm byproducts and soy meal (table H-3). Palm-meal use is assumed to expand at the same rate as palm oil production, while soy meal continues to make up the majority

Figure H-3

Malaysia: Soy Product Imports

Million tons



of protein feed requirements. Soy meal demand is met both by meal imports and by domestically-crushed imported soybeans. Since Malaysian crushing operations first began in 1978, soybean imports have grown more rapidly than direct imports of soy meal (figure H-3).

Preference for unprocessed soybean imports is expected to continue, resulting in an 8.6 percent annual rise in soybean imports compared with only a 3.1 percent annual increase in soy meal imports until 2000. A key uncertainty in these projections is the ability of processors to expand crushing capacity to accommodate increased imports. However, given the current positive investment environment, this should not be a problem. The majority of the oil derived from Malaysian soybean-crushing operations is exported and so is expected to increase in line with soybean imports.

Tree Crops

Palm oil production has risen from 0.6 million tons in 1970 to an average of 7.2 million tons in 1989-91 and is projected to further expand to 9.8 million tons by 2000. The 3.2 percent average annual growth rate over the projection period is much lower than the 8-percent growth of the 1980's. The slowdown is anticipated because of a slowing of new land development, decreases in the quantity of land moved from rubber to palm-oil production, and the increasing saturation of land planted with mature high-yielding variety clones.

Since income growth and industrialization have led domestic palm oil consumption to expand more rapidly than output, annual growth in exports of palm and palm-kernel oil is

projected to slow from nearly 9 percent in the 1980's to 2.5 percent in the 1990's. The key assumptions in the supply projections are that no further breakthroughs will be made in high-yielding clone technology, and that oil palm area will not again be rapidly expanded. On the demand side, it is expected that an increasing share of palm oil exports will occur in the form of value-added products, and a declining share as either crude or refined palm oil.

Rubber production, the other major Malaysian tree-crop product, is expected to expand only slightly from 1991 levels as a result of continued declines in area planted and increases in yields. Cocoa production, though minor in relationship to palm and rubber, will continue its rapid expansion as a result of an expansion in high-yielding tree use and improved production practices, likely propelling Malaysia to the position of the world's largest producer.

Timber

The base projections assume that the government will limit the growth in log production to 1 percent annually, but that the relatively high growth in domestic wood processing will continue and exports of unprocessed lumber will be curtailed. In the forestry sector, production of saw logs is assumed to increase at 1 percent per annum, down from historic growth of 4-5 percent due directly to changes in Government of Malaysia policy. Exports of both saw logs and sawn timber are expected to stagnate at 1991 levels, also due to government policy. As a result, all growth in production will be destined for further processing in Malaysia. The increases in domestic processing could result in higher export earnings as wood products will be exported in a higher-value form.

Alternative Income Scenario

For most commodities analyzed here, the baseline forecast results depend primarily on Malaysian economic growth. The annual income growth of 7-8 percent assumed in the base

Table H-4. Malaysia: Results of high income scenario

	2000		
	Base scenario	High income	Change
	----Thousand tons----		Percent
Net imports			
Wheat	1,383	1,513	9.4
Rice	485	467	-3.7
Corn	2,721	2,823	3.7
Oilseeds	1,242	1,302	4.8
Net exports			
Oil meals	1,293	1,263	-2.3
Oils	7,993	7,897	-1.2
Poultry	72	72	.0
Pork	16	16	.0

scenario is higher than the 6-percent average growth of the entire 1980's but lower than the 9-percent growth achieved from 1989-1991. As the middle income economies of South-east Asia have consistently surprised analysts with their ability to sustain high rates of growth, this scenario examines the impact of a 1 percent increase in annual economic growth.

Higher income growth in Malaysia could be spurred by many factors including expansion of the global economy, reduced trade barriers in Asian importing nations under the ASEAN trade agreement, or through reductions in global trade barriers under a GATT agreement. The effects of the scenario can generally be reversed to permit analysis of the impact of a 1 percent decline in assumed income growth rates.

Increased income growth has a number of implications for Malaysian agriculture (table H-4). Wheat consumption, positively correlated with the dietary and demographic changes associated with income growth, further increases while the demand for rice falls. As marginal quantities of both grains are imported, the net trade effect is dependent on the relative magnitudes of the respective income elasticities. In this case, increases in wheat consumption more than offsets the decline in rice demand, resulting in a 6 percent net rise in food-grain imports by 2000.

In the feed-livestock sector, income growth results in increased production and demand for livestock products. Feed supplies to sustain the additional livestock production must be imported, resulting in increases in imports of corn and soybeans over the base scenario of roughly 4 and 5 percent, respectively. This outcome assumes that there is sufficient domestic capacity to crush the additional soybean imports—otherwise the incremental imports would occur in the form of soy meal.

Alternative Rice Policy Scenario

As the Malaysian economy matures and productivity continues to rise, the opportunity costs of rice support policies rise. The government is therefore increasingly pressured to reform its rice policies and has in fact already undertaken actions in an effort to rationalize production. The reform process is made easier as food security concerns for rice decline with the rising importance of wheat in the diet. Because of rising costs and declining importance of rice, there is considerable likelihood that production will be further rationalized.

To simulate the impact of further declines in rice production support, a two-phase scenario was conducted in which the two major forms of support were eliminated. In the first phase, fertilizer subsidies were reduced to zero over a 10-year period. In the second phase, domestic producer prices were decreased by 10 percent—establishing rough parity between world and domestic prices. Changes in consumer price policy appear unlikely and, therefore, were not examined. As expected, both policies result in decreased rice production (table H-5 and figure H-4).

The decrease in the fertilizer subsidy causes production to fall 11 percent below the base scenario in 2000, while the change in producer prices decreases production about 3 per-

Figure H-4

Malaysia: Rice Production Scenarios

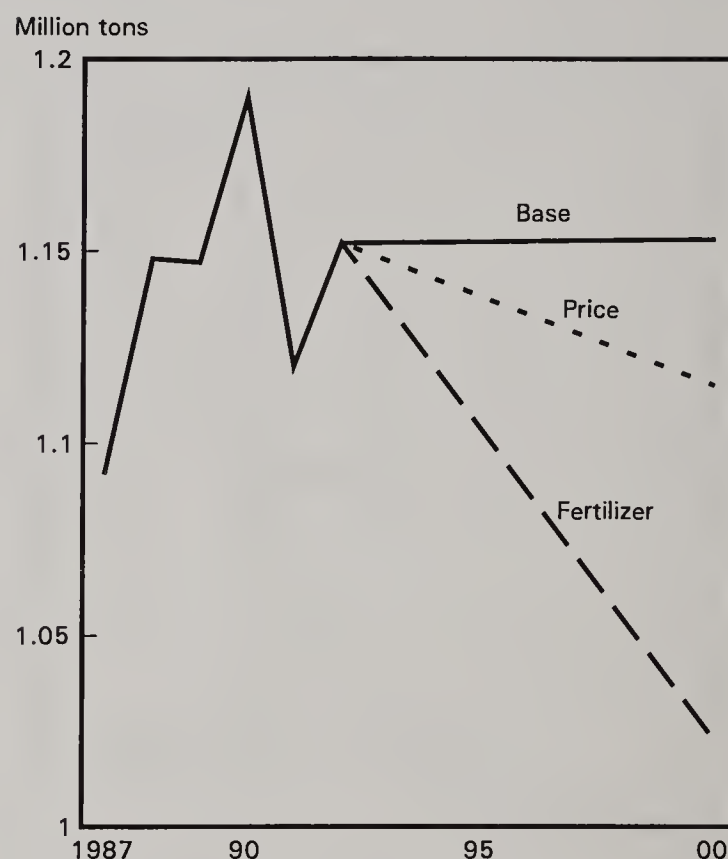


Table H-5. Malaysia: Results of rice policy reform scenarios

	2000			
	Base scenario	Fert. subsidy reform	Producer price reform	Combined reform
Thousand tons				
Rice				
Production	1153	1023	1115	990
Net imports	485	614	522	648
Consumption	1636	1636	1636	1636

cent from the base. When price policy reform is combined with the fertilizer subsidy reduction, production falls 14 percent from the base scenario, resulting in a 34 percent increase in imports over the base. The decline in production associated with price reform is smaller than would have been expected in the past, because falling real prices on world markets have already significantly eroded the implicit price subsidies afforded producers.

Alternative Forest Policy Scenarios

Future growth in timber extraction will largely be predicated on government policy and policy enforcement. The govern-

Table H-6. Malaysia: Impact of alternative logging rates

	2000		
	Base scenario	Historic growth	Government plan
Million cubic meters			
Saw logs			
Production	43098	55628	29000
Exports	14425	20428	7500
Sawn timber			
Production	12488	13468	9835
Exports	2386	8523	4580

ment has stated plans to dramatically cut log production and exports, as well as production and exports of saw logs and sawn timber. Though changes in timber export composition began early in the 1980's, it was not until the end of that decade that declines in log output could be discerned. The government's ability to cut production as rapidly as planned over the next 10 years is, therefore, questionable. Here, the impacts of alternative assumptions concerning log extraction rates are analyzed. In the first ("historic growth"), trends of the last 20 years are allowed to continue while, in the second ("government plan"), the government is assumed to be successful in achieving its 1995 targets.

Under the scenario assuming historic growth in timber extraction and utilization, production of saw logs and sawn timber increase 29 and 8 percent, respectively, over the base scenario, while exports rise 42 and 357 percent, respectively (table H-6). Conversely, if government targets could be reached, saw-log and sawn-timber production fall 33 and 21 percent, respectively, from the base scenario. Perhaps most striking in this analysis is the almost three-fold difference in saw-log exports between the historic and plan scenarios. The potential variability in exports, largely contingent on government policy enforcement, is particularly important for hardwood-timber trade given Malaysia's prominent role in the sector.

In addition to the areas already discussed, timber extraction also has important implications for agriculture through its impact on land availability. For example, it has been estimated that each additional hectare of deforestation is correlated with an approximate 0.5 hectare increase in area devoted to palm oil. The time period for these projections is too short

to explicitly consider the impacts of the alternative forestry scenarios on tree-crop production, because most planting affecting production in the 1990's has already occurred. However, continued success in controlling deforestation will increasingly constrain expansion of agricultural area and tree-crop production after 2000. At the same time, over-exploitation of forest resources will continue to negatively impact land and water quality, decreasing long-run agricultural productivity.

Conclusions

All signs indicate that the generally market-oriented, trade-based Malaysian economy will continue to expand at a relatively rapid rate in the next decade. The agricultural sector, though growing, will likely continue to decline in relative importance, the result of faster growth in the manufacturing and service sectors, and rising wages. While Malaysia's dependence on world market growth and access creates a major area of uncertainty in the outlook, uncertainty associated with political instability and threats of change through government fiat is relatively small compared with many other Asian nations. As the Malaysian economy grows and moves further away from agricultural dependence, opportunities for Malaysian agricultural imports will expand.

However, the scope for increased U.S. agricultural exports may be relatively small. Some potential exists to increase U.S. feed exports to supply Malaysia's growing livestock sector. Soybean exports, in which the U.S. already maintains a 15 percent market share, are particularly promising. However, Malaysia has not traditionally been a buyer of American farm products, and U.S. benefits from increased agricultural imports may accrue only indirectly through overall trade expansion. For instance, there are no signs that the United States will be able to penetrate the growing market for wheat products and rice because of the qualitative and geographic advantages of regional suppliers.

In addition, Malaysian palm-oil exports will continue to compete with U.S. products for edible oil markets. Malaysia will likely remain a low-cost supplier of edible oil, particularly in Asia, limiting the potential for U.S. soybean oil exports, in addition to placing downward pressure on U.S. soybean oil prices and soybean-crushing margins. One bright spot may be the potential for U.S. exports of beverages and tobacco—for which the U.S. products already have a significant presence—and for other high-valued processed agricultural products. Imports of these products will likely continue to grow as Malaysian incomes and wages expand, urbanization persists, and the country solidifies its position as a middle-income nation.

BOX 8

Asian Feed Demand

Increased demand for livestock feeds, including feed grains and oilmeals, has been a major factor in rising Asian farm imports—as well as U.S. farm exports to the region. Although China and Thailand export coarse grain and China and India export oilmeals, Asia is a large and growing net importer of both commodities. However, current supply and demand trends vary across the region and may portend shifts in the rate and source of future growth in feed demand.

Feed Grains

The gap between Asian coarse grain production and use is no longer increasing, as it did during the 1970's and early 1980's. This pattern reflects slower growth in feed demand in East Asia and China, and more substitution of feed wheat for coarse grain since the mid-1980's.

- East Asia, with little production capacity and rapid growth in demand, has accounted for the bulk of Asian coarse grain imports. However, growth in demand slowed in East Asia during the 1980's, the result of increasing imports of livestock products, slowing demand for livestock products at relatively high income levels, and constraints on livestock production.
- Growth in feed grain demand also appears to have slowed in China, following rapid expansion between the mid-1970's and mid-1980's. However, China's imports could grow more rapidly in the 1990's because of constraints on additional production.
- Potential for gains in feed grain imports also appears strong in Southeast Asia. Growth in feed demand is now fastest in these countries, and production potential appears limited in Thailand—the region's major producer and exporter.
- Corn dominates Asian feed grain use, but feed wheat gained a larger market share during the 1980's, particu-

larly in South Korea. As a result, shifts in relative wheat and corn prices will be increasingly important to future trade patterns.

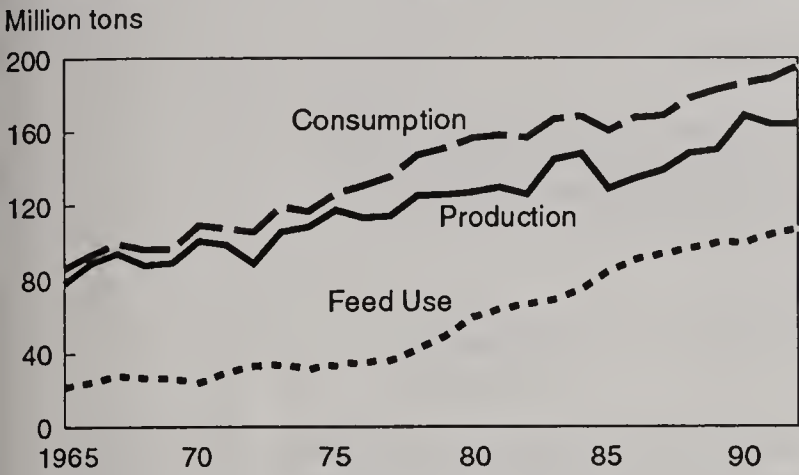
- Corn accounts for the bulk of Asian feed grain imports and, despite variability, U.S. corn typically earns roughly a 70-percent market share. Future increases in U.S. sales will hinge on restored growth in the region's aggregate demand for feeds and on exploiting opportunities created by declining exportable surpluses in Thailand and China.

Oilmeals

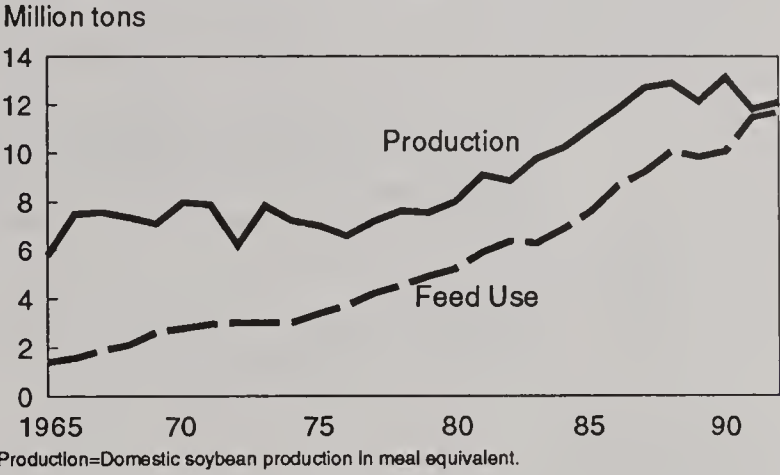
There has been a sharp reduction in Asia's net surplus of soybean meal since the late 1980's. Slowed production in China and Southeast Asia and strong demand in East and Southeast Asia are key factors which suggest potential for rising net imports in the 1990's.

- As with feed grains, East Asia accounts for the bulk of Asia's soymeal imports. However, in contrast to coarse grains, growth in soymeal demand remains strong and steady in East Asia.
- Growth in soymeal demand is most rapid in Southeast Asia, and imports are likely to expand because soybean production is mostly inefficient in this region and land resources are limited.
- In China, rising feed demand for soybeans is being partially offset by declining food use. However, production is slowing and reducing exportable surpluses. India is Asia's only growing net exporter of soybean meal.
- Robust expansion of Asia's total imports of oilmeals has increased soybean and meal imports. But, since the early 1980's, the soybean share of total oilseed and meal imports has dropped. This trend is partly caused by improved crushing margins for seeds with lower meal and higher oil content, primarily rapeseed and canola in East Asia. This trend may continue to affect Asian soybean and meal demand in the 1990's.

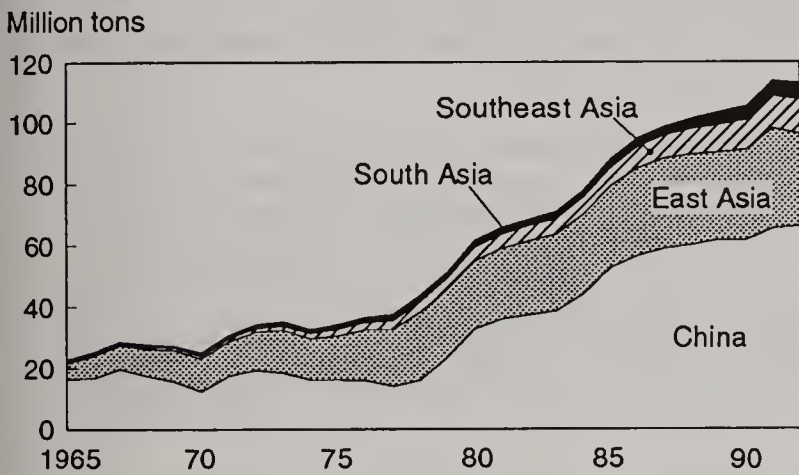
Coarse Grain Supply and Use



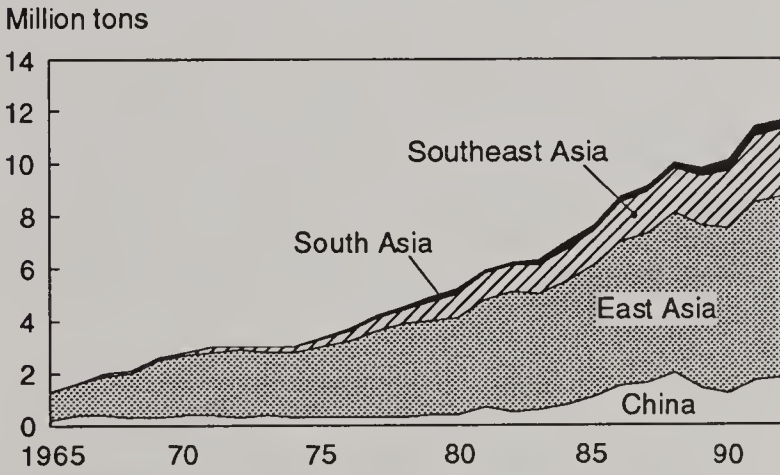
Soy Meal Production and Feed Use



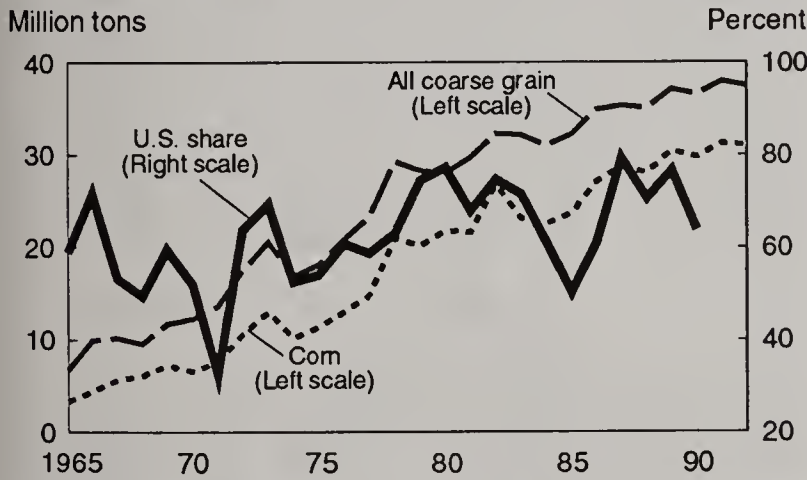
Grain Feed Use by Subregion



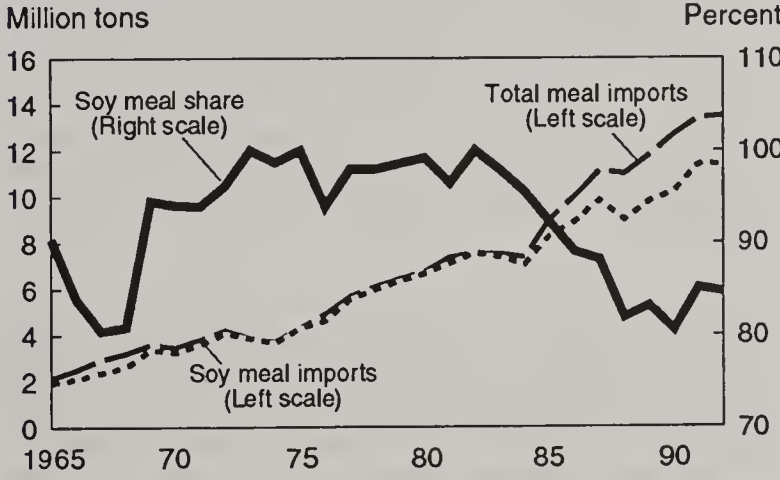
Soymeal Feed Use by Subregion



Coarse Grain Imports



Meal Imports



Pakistan

Rip Landes and Mark Giordano

Abstract: Rising incomes coupled with supply constraints are projected to boost Pakistan's demand for imported wheat, edible oil, and feed grain in the 1990's. Little expansion of rice exports is anticipated, and the bulk of rapidly expanding cotton supplies is expected to be processed to meet domestic and export demand for textiles.

Keywords: Pakistan, agriculture, policy, trade, wheat, rice, corn, oilseeds and products, animal products, cotton.

Introduction

Pakistan ranks sixth in population and tenth in national income among Asian countries. Economic growth averaged 6.1 percent during the 1980's, although the benefits were partially offset by a population growth rate of 2.9 percent—high by comparison with other Asian countries. Agricultural output continues to increase rapidly, and agriculture remains the most important sector—contributing a quarter of Gross Domestic Product (GDP) and half of all employment. However, non-farm sectors are expanding their roles. The manufacturing sector, consisting largely of textiles, is growing 8 percent annually and now accounts for nearly one-fifth of income and employment.

Trade is also increasingly important to growth, with both imports and exports expanding more rapidly than the economy as a whole. Merchandise imports, primarily machinery, petroleum, chemicals, and foodstuffs, totaled \$7.5 billion in 1990. Exports totaled about \$5 billion and consisted principally of cotton and cotton-based products. Farm imports are rising nearly 5 percent annually, reaching \$1.3 billion in 1990—the ninth largest in Asia. Major farm imports are edible oils, of which Pakistan is among the world's largest importers, and wheat. U.S. farm exports to Pakistan averaged \$438 million in 1988-90, making it the sixth largest market in Asia.

Despite impressive gains in the cotton sector and a strong agricultural resource endowment—including one of the most extensive irrigation systems in the world—Pakistan's capacity to maintain high levels of self-sufficiency in foods and feeds is in question. If ongoing structural economic reforms succeed in sustaining rapid growth, the farm sector may be hard pressed to keep pace with demand without improved incentives and investment.

Economic Trends and Policies

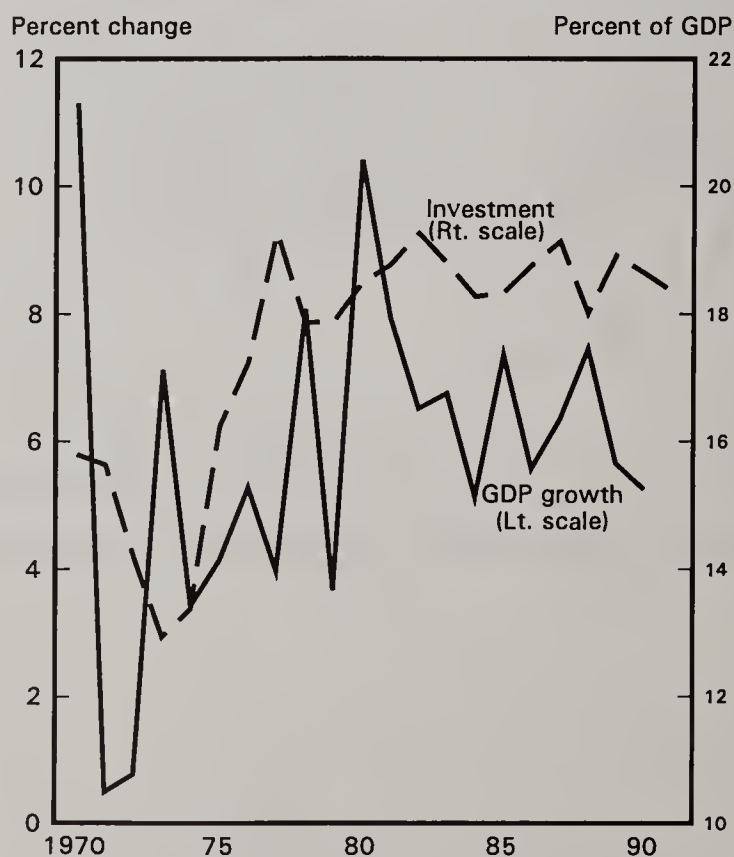
Gains in farm and manufacturing output led to strong real GDP growth of 7 percent annually during 1980-87, but growth slowed to about 5 percent annually during 1987-92 (figure I-1). The downturn was associated with persistent trade and fiscal imbalances that were aggravated by external shocks, combined with chronically weak domestic savings and investment (figure I-2). The pursuit of growth-oriented policies

during the 1980's, including gradual liberalization of nonfarm trade, failed to stimulate adequate savings and investment. Key constraints were pervasive regulation and weak incentives for private enterprise, and the poor performance of the public sector—which accounts for most manufacturing and infrastructure capacity.

A structural reform agenda, including reduced government spending, gradual deregulation of trade and industry, and elimination of key price distortions, was adopted in 1988 with the support of the donor community. Implementation of reforms stalled in 1990, however, in a climate of political instability and inability to adjust to the large oil price shock associated with the Gulf crisis. The current coalition government, which gained power in late 1990, reinvigorated the

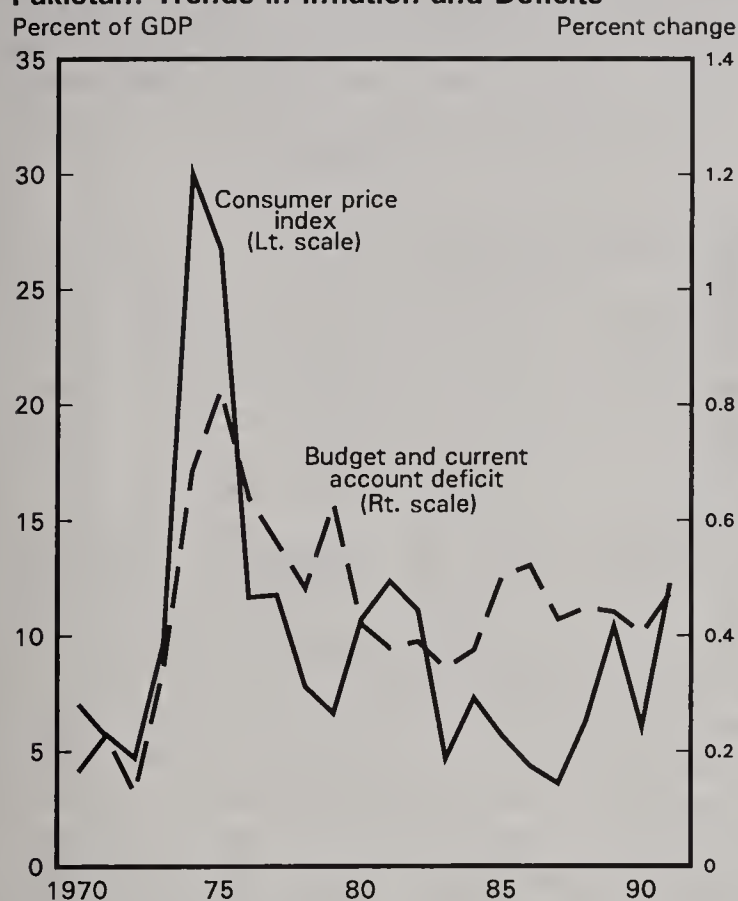
Figure I-1

Pakistan: GDP Growth and Investment



Source: Government of Pakistan

Figure I-2

Pakistan: Trends in Inflation and Deficits

Source: Government of Pakistan

reform process by moving quickly to adjust prices, liberalize trade, finance, and industrial policy, and reduce the size of the public sector.

Despite progress in implementing reforms since 1990, economic performance remains threatened by large fiscal and balance of payments deficits, low savings and investment, poor infrastructure, pervasive regulation, and weak performance by the public sector. The deficits have resulted in increased domestic and foreign borrowing, higher inflation, and sustained shortfalls in development expenditures. Achievement of policy benchmarks has been impeded by the uncertain climate preceding and following the fall of the Sharif government, leading to delays in disbursement of donor support.

Trade Performance and Policies

Economic policy remains under considerable pressure from Pakistan's balance of payments problems. Export performance has been a bright spot, with earnings rising 13 percent annually during 1985-91. Exports have been led by cotton-based manufactures, which grew 20 percent annually during the period and now account for 53 percent of exports. Import growth was relatively sluggish during the last half of the 1980's, averaging about 5 percent during 1985-91. However, imports have climbed since 1989 due to the surge in oil prices during the Gulf crisis, and to quickening imports of industrial raw materials and equipment in response to domestic deregulation and a more liberal trade regime.

Other key sources of balance of payments pressure are the decline in remittances from Pakistani workers employed in the Middle East, a reduction in bilateral aid from the United

States, and slowed disbursement of multilateral aid because of delays in implementing reforms. Remittances had grown rapidly in the 1970's, and roughly matched export earnings by the early 1980's, but are now declining. Reduced U.S. aid and delayed multilateral disbursements necessitated a draw-down in reserves, increased commercial borrowing, and continued regulation of some imports. Foreign debt is now a significant burden, with debt service equalling 28 percent of export earnings in 1990.

Balance of payment problems will force an emphasis on expanding exports, particularly towards value-added items. This may entail continued support for the textile sector, more industrial deregulation, efforts to diversify exports, and a continuation of flexible exchange rate policies. Liberalization of imports will likely continue, but at a pace dictated by export earnings and a sustainable debt burden. Reductions in quantitative and tariff restrictions will likely focus on industrial goods which are, in contrast to farm goods, protected in Pakistan and uncompetitive in world markets.

Agricultural Trends and Policies

Wheat, cotton, rice, and sugarcane are the major crops produced in Pakistan. Milk, beef, mutton, poultry, and eggs are the major livestock products. Farm imports consist principally of wheat, the food staple, and edible oils. Principal farm exports are cotton and rice, and Pakistan is traditionally a major exporter of these commodities. Pakistan has been a net importer of farm products since the late 1980's, the result of rising imports of wheat and edible oils, as well more exports of cotton in value-added form.

The farm sector registered strong annual growth of 5 percent during the 1980's, but performance was uneven (table I-1). Output of cotton and livestock products expanded at an above-average pace, while that of most other commodities grew less

Table I-1. Pakistan: Agricultural growth rates

Commodity	1960-70	1970-80	1980-90
Percent			
Wheat	5.8	4.9	2.8
Rice	7.8	3.5	.0
Coarse grain	2.1	.8	1.3
Pulses	.8	-3.9	4.5
Sugarcane	6.6	3.3	1.1
Cotton	6.9	2.1	7.8
Rapeseed	2.3	-1.1	-.5
Milk	N/A	2.0	5.6
Beef	N/A	2.6	4.9
Mutton	N/A	6.5	6.4
Poultry meat	N/A	150.7	16.3
Eggs	N/A	16.4	7.2

Source: Calculated from Government of Pakistan data.

Table I-2. Pakistan: Crop yield comparisons

	Pakistan	India	United States	World
	Kgs./ha.			
Wheat	1,844	2,214	2,401	2,484
Rice, paddy	2,429	2,624	6,340	3,508
Corn	1,384	1,532	7,180	3,695
Seed cotton	1,943	727	1,857	1,664
Rapeseed	751	880	1,517	1,356

Source: FAO

than 3 percent annually. Uneven growth partly reflects the pattern of demand and economic incentives, but also raises questions about the adequacy of investment, institutional services, and government price policy in lagging sectors.

Most crops have relatively low yields, particularly in view of the quality of land and water resources (table I-2). Eighty percent of cultivated land is irrigated, primarily through a surface water network, but also by growing use of tubewells. Despite this, yields of major crops, including cereals and oilseeds, remain low relative to other countries at a similar level of development.

One factor affecting productivity is poor maintenance and weak management of the irrigation and drainage system, resulting in significant land deterioration through waterlogging and soil salinity. Additional factors are weak institutional services, including low funding for public research and extension, and shortages of credit and quality seed.

Policy Developments

Although the effects are less severe than in the 1970's, current policies impose a heavy tax on the farm sector and farm incomes. Taxes are imposed primarily through trade policies that enforce relatively low internal prices and, until recently, by maintenance of a greatly overvalued exchange rate. The benefits of these policies accrue largely to agricultural processors, consumers, and the government. As in other low income countries, these policies are driven by the political and economic importance of providing stable and affordable food prices for a predominately poor population, and by the relative ease of collecting revenues through trade taxes.

Producer incentives improved in the 1980's. In addition to raising prices, recent reforms have included reductions in fertilizer subsidies, replacement of the wheat rationing and subsidy system with open market sales to stabilize prices, and partial privatization of cotton, edible oil, and wheat trade. Steady real depreciation of the rupee has also served to reduce implicit producer taxes and consumer subsidies. However, domestic prices of major commodities remain below border prices, implying continued producer taxation and consumer subsidies (table I-3).

Table I-3. Pakistan: Producer and consumer subsidy equivalents

	1982	1983	1984	1985	1986	1987
% of producer value						
Producer subsidy equivalents:						
Wheat	-23	-47	-36	-14	-41	-18
Basmati rice	-91	-95	-127	-108	-128	N/A
Coarse rice	-11	-22	0	11	-1	N/A
Seed cotton	-52	-37	-50	-13	-52	N/A
Sugar	-4	10	15	1	11	N/A
Milk	-5	-7	-5	3	5	N/A
Beef	-18	-22	-18	-21	-17	N/A
Poultry meat	-22	-26	-22	-26	-18	N/A
Eggs	-20	-24	-20	-23	-19	N/A
% of consumer value						
Consumer subsidy equivalents:						
Wheat	41	49	53	35	56	34
Basmati rice	51	59	81	81	96	N/A
Coarse rice	-7	-2	-11	-14	-2	N/A
Cotton lint	88	66	75	60	100	N/A
Sugar	-35	-42	-51	-43	-45	N/A
Milk	8	9	7	2	1	N/A
Beef	20	25	20	24	19	N/A
Poultry meat	20	25	20	24	19	N/A
Eggs	20	25	20	24	19	N/A

There are several continuing sources of pressure for reform. Consensus is growing that policies intended to benefit low income consumers are not hitting their target—a finding that contributed to the 1987 reform of the wheat ration system. Another factor is the need to reduce large domestic budget deficits—in part driven by subsidies—that have sparked inflation, increased debt, and drawn the attention of multilateral donors. Finally, since the bulk of increased food imports during the 1980's were financed by U.S. export programs, reduced U.S. assistance has tightened the balance of payments position and increased pressure for import substitution.

Wheat Sector Trends

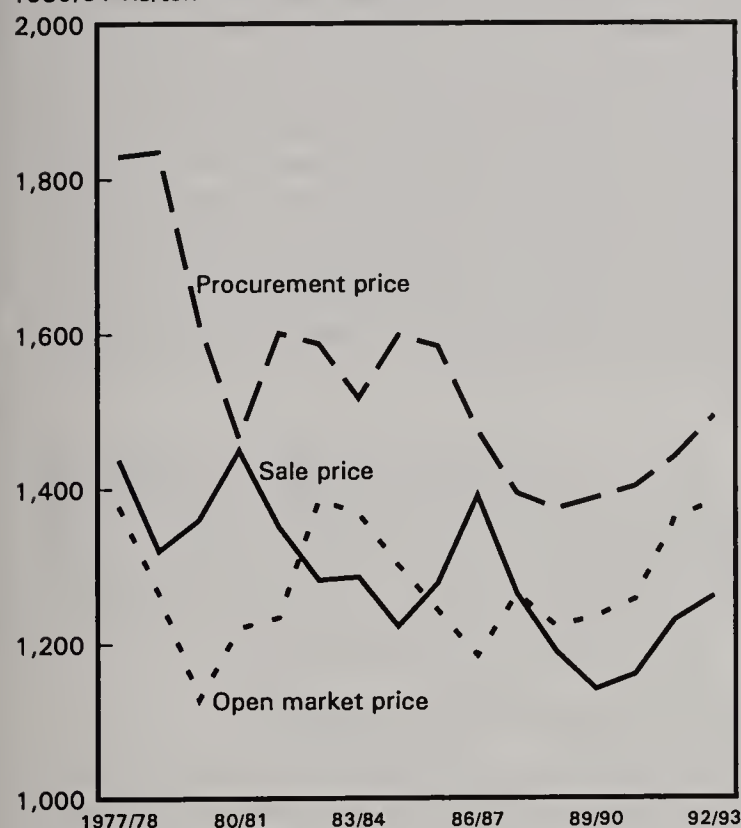
Wheat is Pakistan's major crop and food staple. From the mid-1960's when high-yielding wheat technology was introduced until the early 1980's, production grew faster than demand and imports fell. Both area planted and yield increased rapidly. By the early 1980's, wheat imports were small, consisting largely of relief supplies for Afghan refugees. Since the early 1980's, however, growth in demand has outstripped growth in supply and imports have increased.

Recent trends, as well as the outlook for the 1990's, are driven by both technical and policy factors. Wheat yield growth has stalled well below levels achieved in neighboring India. A key reason is that an increasing portion of wheat area is sown following cotton. As a result, wheat planting is delayed

Figure I-3

Pakistan: Trends in Administered and Open Market Wheat Prices

1980/81 Rs/ton



Source: Government of Pakistan

well past the optimal sowing time, leading to a significant loss of yield potential. Other factors inhibiting technical gains are low prices and weak institutional support, in areas like basic varietal research, extension, seed supplies, and market infrastructure.

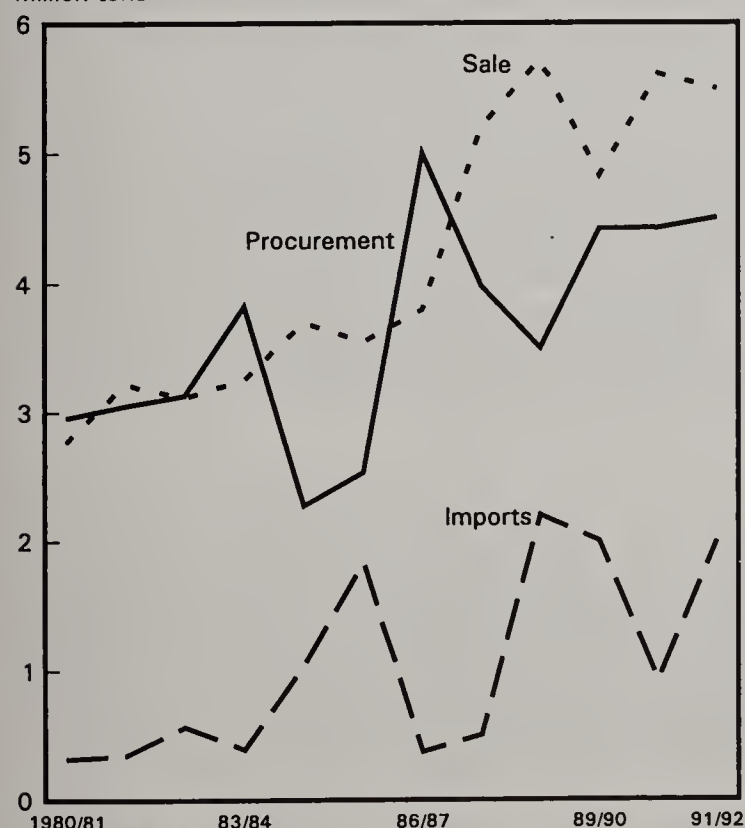
Policy intervention in the wheat sector consists of producer price supports, input subsidies, consumer subsidies on imported and domestically procured wheat, public buffer stocks and, until very recently, a government monopoly on imports. Despite steps to reduce intervention, the net effect of these policies is to tax producers and subsidize consumers. This bias reflects traditional concern with the welfare of low income consumers, and has tended to stimulate wheat demand by maintaining stable and declining real prices.

Since the late 1980's, wheat procurement (support) prices have been increased, but they remain well below import parity (figure I-3). Relative prices and profits still favor cotton—leading to more and more late planting of wheat. Despite the abolition of the flour ration system in 1987, consumer subsidies remain high. The government now wholesales all domestically procured and imported wheat to millers from government stocks. Although unit subsidies are now lower, the volume of sales is up significantly—boosting imports and consumption (figure I-4). The cost of the wheat subsidy has increased, reaching 6 percent of public revenue in 1988/89, creating pressure to raise domestic prices nearer import parity and to reduce the dominant role of government in distribution and storage.

Figure I-4

Pakistan: Trends in Government Wheat Operations

Million tons



Source: Government of Pakistan

The 1991 decision to permit wheat imports by private traders is not expected to have a major impact on wheat imports. Private imports now face no quantitative or tariff restraints, but are constrained by generally low domestic prices relative to world prices. Unless domestic prices are adjusted upward to import parity levels, private imports will likely expand only gradually and tend to offset, rather than augment, government imports.

Cotton Sector Trends

The cotton sector is the single largest contributor to national income, employment, and foreign exchange earnings. Raw cotton is the second largest crop and cotton-based manufactures account for about 25 percent of industrial output and 35 percent of employment in the formal industrial sector. Together, exports of raw cotton and cotton-based manufactures were about \$3.7 billion, or 60 percent of total exports in 1990/91. Pakistan now accounts for about 10 percent of world exports of raw cotton, 25 percent of yarn, and 8 percent of cloth.

The trend in cotton production, use, and trade has been sharply upward since the mid-1980's. During 1985-91, cotton production grew about 8 percent annually; cotton use, 16 percent; and exports of cotton and manufactures, 11 percent. Rapid growth has been associated with adoption of improved varieties and cultural practices, higher prices, and growth in capacity to produce cotton yarns and cloth for export.

Technical and policy factors will be critical to developments in the cotton sector in the 1990's. In the 1980's, the adoption of new varieties and improved cultural practices, particularly pesticide use, fueled rapid growth in cotton yields and profitability. Most cotton area is now planted to the improved varieties, so incremental gains will be increasingly dependent on further improvements in cultural practices, or future varietal improvements.

Cotton production, processing, and trade is a major policy arena in Pakistan and, over time, policy bias has shifted between the interests of rural producers and urban industrialists. Since the late 1970's, policies have sought to balance producer and processor interests, but producers are still taxed by price and raw cotton export policies that suppress domestic prices. Although production and efficiency are reduced, industrial employment and exports of yarns and textiles are enhanced. In the 1990's, however, trade barriers in importing countries may prevent Pakistan from sustaining rapid growth in exports of cotton-based manufactures. The effect of these barriers could be either a shift towards raw cotton exports, reduced cotton production, or both.

Rice Sector Trends

Pakistan is a major rice exporter, with annual exports averaging about 1.1 million tons. Production and exports have shown no growth since the late 1970's because of technical, economic, and policy constraints. Both relatively coarse, high-yielding varieties and fine, long-grained, aromatic basmati varieties are produced. The former are produced at well below their yield potential because of typically very low margins in both domestic and highly competitive foreign markets. Low-yielding basmati rice, on the other hand, is favored by higher income consumers and, in restricted volumes, earns high margins in domestic and foreign markets.

Government policy, implemented through adjustments in procurement (support) prices and the actions of the government Rice Export Corporation, has been to shift incentives between the two varieties based on market conditions. In general, production and exports of both varieties are taxed. Taxes on basmati exports are particularly large, sufficient to cover any trading losses on coarse rice exports and still contribute significantly to government revenue.

During the 1990's, developments in the rice sector will likely continue to be driven by world market conditions. There is substantial scope to increase coarse rice yields if world prices rise and policies and institutions are supportive. Basmati varieties have limited potential, but the heavy taxes imposed by current policies suggest that reduced intervention would increase production and exports. However, the limited market for basmati rice—primarily in the Middle East—will constrain its cultivation.

Oilseed Sector Trends

Consumption and imports of edible oil expanded at a strong and steady pace during the 1980's, and Pakistan is now among the world's largest importers. Annual imports now exceed 1 million tons and are dominated by palm oil. Edible oil pro-

duction capacity is very limited. Domestic production is primarily from cottonseed, which yields relatively little oil. Gains in rapeseed, the other major traditional oilseed, are curbed by competition with wheat for land. Efforts to introduce soybean and sunflower have met with no success.

In contrast to neighboring India, Pakistan has not undertaken an aggressive import substitution program. Domestic prices of oilseeds are set near world prices and institutional support is weak. Although oil imports have faced both quantitative (state trading) and tariff constraints, consumer prices have been much more stable and much closer to world prices than in India. As a result, domestic demand has increased more rapidly than in India, and at least some of Pakistan's imports are driven by the profitability of smuggling edible oil into India.

Future production gains that would significantly affect trade would require sharply higher price incentives and institutional support from the government to induce greatly increased production of rapeseed, soybeans, or sunflower. Performance to date provides little basis to expect significant gains in production of oilseeds other than cottonseed.

Feed and Livestock Sector Trends

The dairy and poultry sectors, together with maintenance of a large draught animal herd, account for most of the growth in feed demand. Milk is, by far, Pakistan's major livestock product. Per capita milk production of about 130 kilograms is high by world standards, and output is expanding by about 6 percent annually. Poultry meat and egg outputs are small by comparison but growing at 16 percent and 7 percent, respectively. Beef and mutton are also important products, with production and use growing at 5-6 percent annually. However, beef is produced primarily from culled dairy animals, and mutton is produced from grazed animals, so they have little direct impact on feed demand.

Data on feed supply and use are poor, but it is apparent that growth in feed demand is increasingly straining the limits of domestic supply. Prices of feed stuffs are rising faster than prices of livestock products. However, it is difficult to determine when the economically viable options for drawing previously unused plant materials into feed use will be exhausted. Also unclear is the extent to which higher prices will stimulate feed production, or whether future policies will permit imports or stress import substitution.

It is likely that the bulk of rising demand for energy feeds will have to be met by corn. While sorghum, wheat, corn gluten meal, wheat bran, and rice bran are also fed, their output is either very small or driven by factors other than feed demand. However, production of corn has been stagnant, with some improvement in yields roughly offsetting a gradual decline in area planted because of competition with cotton. Rising prices could call forth more production, but past performance provides little basis to expect major gains.

Major sources of feed protein are cottonseed meal, rapeseed meal, fish meal, and blood meal. Relatively small amounts of soybean meal are imported from India. Supplies of cot-

tonseed meal are expanding with cotton output, but supplies of rapeseed and fish meal have been flat. There is likely scope for drawing more domestic meal production out of other uses and into feed use as prices rise. However, technical limits on the use of cottonseed and rapeseed meals, and the poor quality of available fishmeal, could eventually necessitate significantly larger soybean meal imports.

Trade policy now places no explicit quantitative restriction on feed imports, but imposes a 25-percent tariff. At current domestic and international prices, the tariffs do limit trade. An additional import constraint is that full shipload quantities must be purchased to secure low prices, and traders are reluctant to assume price risk on large quantities, particularly when margins are slim.

Issues Affecting Agricultural Trade in the 1990's

Changes in Pakistan's agricultural trade during the 1990's are likely to be driven largely by growth in per capita incomes, and by the nature of agricultural policy adjustments. Underlying issues that inject uncertainty into the outlook are the impact of weak investment performance on future agricultural productivity, and the pace at which rising feed demand is translated into significant feed imports. The base projections of supply, demand, and trade provided below incorporate the following assumptions on these issues. Alternate scenarios explore the sensitivity of the projections to different assumptions regarding income growth, food grain policies, and irrigation investment.

Income Growth

Annual growth in real GDP is forecast to average about 6 percent during the 1990's, near that of the 1980's. Implicit in this projection are the assumptions that the government will succeed in stabilizing inflation at historical average rates of 6-8 percent, and that a fairly aggressive pace of economic reform consistent with the current IMF-supported restructuring plan will be maintained. Stronger performance is expected to be impeded by weak domestic investment during the 1980's, and limited prospects for strong gains in domestic savings or foreign aid and investment through the mid-1990's. Key constraints are likely to be the lagged impact of trade reforms in generating a broader export base, combined with the outlook for weak remittances, limited U.S. bilateral aid, and more pressure on imports because of liberalization of industrial imports.

Agricultural Policy Reform

The agricultural sector is not expected to be the target of major reforms during the 1990's. It is assumed that reforms will focus on the industrial sector, where rates of protection are relatively high and there is a need to establish export competitiveness. Declining industrial protection, however, will benefit agriculture through improved domestic terms of trade.

Budget pressures and concern with enhancing economic efficiency are expected to result in further reductions in agricultural subsidies, and in producer taxation. However, major

shifts in farm price and trade policies are unlikely because such reforms could hamper employment growth and fuel inflation by raising internal prices for a key wage good (wheat), and industrial raw material (cotton). Expected policy developments are:

- Reflecting developments since 1987, real wheat producer and consumer prices will be increased slowly, gradually reducing subsidies on consumers, taxes on producers, and government's role in the sector. Domestic prices are assumed to generally remain below import parity, with private imports offsetting, rather than augmenting, government imports.
- A key side effect of gains in cotton productivity and profitability has been the marked slowdown in wheat yields as extended cotton harvests lead to more late planting of wheat. There is a tradeoff between the cost of wheat imports and gains in export earnings and jobs in the cotton sector. So far, policymakers have considered this a tradeoff worth making. But, as the withdrawal of U.S. concessions raises the real cost of wheat imports, policy makers will face more pressure to adjust relative incentives.
- Rice policy will not change significantly unless world prices for coarse or basmati varieties strengthen significantly.
- There will be only modest increases in domestic cotton prices to maintain competitiveness with other crops. However, price and trade policy will continue to tax production and exports of raw cotton, to the benefit of manufacturers of cotton-based goods.
- There will be no fundamental change in policies affecting oilseed production or edible oil imports. Limited prospects for import substitution will sustain consumer-oriented policies.
- Fertilizer and credit subsidies will be further reduced, but not eliminated. Reduction of irrigation subsidies is not expected because of intractable problems involved in implementing user fees.
- Tariffs on imports of feeds and livestock products will remain the only major intervention in the feed-livestock sector.

Feed Import Demand

Future feed import demand will hinge on the interaction of numerous technical, economic, and policy factors. Among these are growth in livestock product demand, changes in feed efficiency and commercialization of livestock product production, supply response among feed crops, and domestic and trade policies. Poor data on the supply and use of livestock products and feeds compounds the difficulty of accurately projecting the point at which domestic feed use will exhaust available supplies of various feedstuffs and necessitate imports.

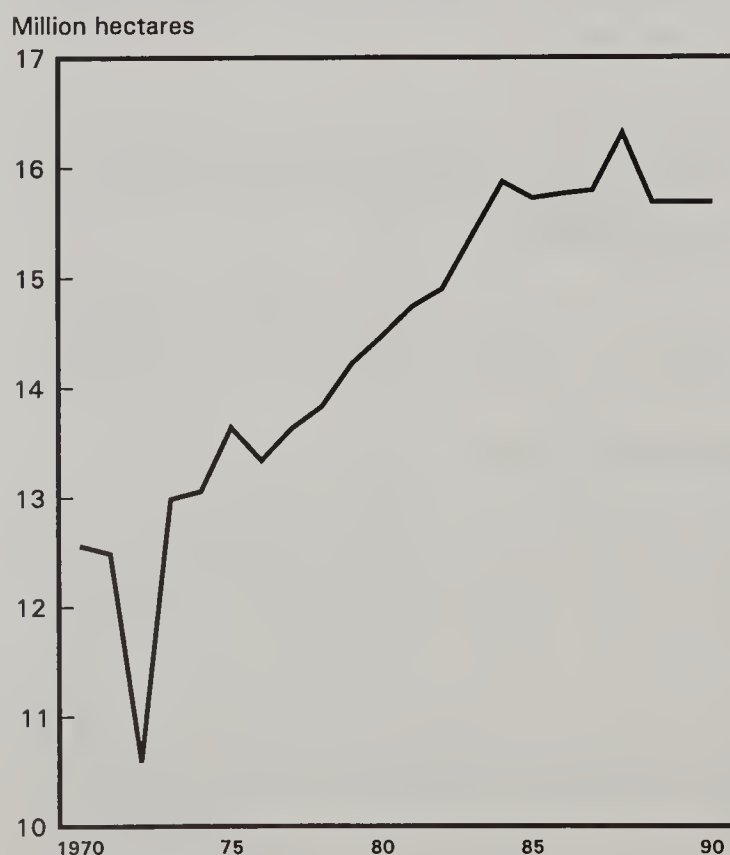
Future livestock product supply and use are projected on the basis of their historical relationships with income and other variables. Feed demand is then projected based on estimates of the current use of energy and protein feeds for commercial production and draught animal maintenance, plus the assumed effects of commercialization and changes in feed efficiency. Commercialization of poultry and egg production, assumed to increase 1.5 percent annually, is expected to boost feed demand, but no changes in average feed efficiency are assumed in the 1990's. For dairy, neither commercialization nor changes in feed conversion are expected to have a significant impact on the trend in the sector's feed demand. In the projections, it is assumed that any excess energy demand is met by corn, and any excess protein demand is met by soybean meal.

Investment and Productivity

For the past decade, low rates of domestic savings and investment have been identified as a potential constraint on the expansion of farm output. With little scope for expansion of the net cropped area, area gains are now dependent on increasing cropping intensity. Higher cropping intensity is, in large part, dependent on investment to improve the efficiency with which surface irrigation water is distributed and used, to maintain the quality of irrigated land through improved drainage facilities, and to exploit potential for groundwater irrigation (figure I-5). Gains in productivity are also heavily dependent on these investments, as well as those that improve the availability of factors of production and institutional support.

Figure I-5

Pakistan: Trend in Irrigated area



Source: Government of Pakistan

There are numerous indications that public and private investment in agriculture has been weak. Shortages of quality seed, extension services, and basic research output, as well as the spread of salinity and waterlogging, are readily observable. However, it is difficult to link these problems directly to production trends. Because of inability to estimate these links, the base projections incorporate no changes in area or yields explicitly associated with investment in the sector. However, a later section of the report will provide partial analysis of the potential impacts of reduced investment in irrigation.

Agricultural Trade Prospects to 2000

The base projections indicate that Pakistan's imports of wheat and edible oils will maintain strong growth during the 1990's. Rising demand for feed grains is also projected to lead to the emergence of corn imports during the decade. Rice production and exports are expected to show little growth, but shift toward higher-valued basmati varieties. While raw cotton output growth will likely remain strong, exports are expected to decline as supplies are used to meet domestic and export demand for textiles.

Wheat

The outlook for wheat production is for the area and yield trends observed since 1980 to continue until the mid-1990's (table I-4). Wheat imports are projected to reach 3.6 million tons annually by 2000. In the early 1990's, it is unlikely that there will be changes in policy or technology that will result in more rapid growth in wheat area or yields. During this period, however, imports are expected to be constrained by relatively sluggish income growth that will slow growth in wheat demand from the rapid pace observed in the 1980's.

By the late 1990's, in the absence of enhanced incentives and institutional support for wheat production, it is projected that import demand will begin to expand more rapidly. Without a restructuring of incentives, it appears likely that growth in wheat area will slow because of the increasing productivity and profitability of cotton. In addition, it is projected that the domestic economy will strengthen by the mid-1990's, leading to more growth in demand, which will be only partially offset by the moderate reduction in consumer subsidies assumed in the base scenario. Feed use of wheat is also expected to expand but, under the assumption that corn imports will be permitted, corn accounts for most of the growth in feed demand.

Cotton

Cotton area and yield are projected to continue to expand rapidly, but not as rapidly as during the 1980's. High relative profitability should sustain growth in area planted at about half the rate of the 1980's. While there is clearly scope for higher yields, particularly since all area is irrigated, yield growth is projected to slow as gains become more dependent on a relatively slow process of improving cultural practices. Although the projections assume a continued decline in real world cotton prices, domestic prices remain below border prices. As a result, Pakistan's cotton should remain competitive in world markets.

Table I-4. Pakistan: Base projections for crops

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
-----Million tons-----					
---Percent---					
Wheat					
Area (Mil. ha)	6.86	7.83	8.98	1.3	1.4
Yield (Kg/ha)	1.57	1.85	2.04	1.7	1.0
Production	10.76	14.47	18.30	3.0	2.4
Net imports	.45	1.75	3.62	14.7	7.6
Consumption	11.06	16.17	21.83	3.9	3.0
Food	11.06	15.89	21.25	3.7	3.0
Per cap. (Kg)	.13	.14	.14	.6	.3
Feed	.00	.40	.58	**	3.7
Rice					
Area (Mil. ha)	1.98	2.08	2.13	.5	.3
Yield (Kg/ha)	1.64	1.55	1.57	-.6	.1
Production	3.26	3.23	3.35	-.1	.4
Net exports	1.03	1.09	1.27	.6	1.5
Consumption	2.25	2.15	2.09	-.5	-.3
Food	2.25	2.15	2.09	-.5	-.3
Per cap. (Kg)	.03	.02	.01	-3.4	-2.9
Corn					
Area (Mil. ha)	.73	.84	.95	1.5	1.2
Yield (Kg/ha)	1.26	1.37	1.47	.8	.7
Production	.92	1.16	1.40	2.3	1.9
Net imports	.00	.01	.32	**	37.5
Consumption	.92	1.17	1.71	2.4	3.9
Food	.92	.78	.76	-1.6	-.2
Per cap. (Kg)	.01	.01	.01	-4.4	-2.8
Feed	.00	.39	.95	**	9.3
Cotton					
Area (Mil. ha)	2.12	2.71	3.08	2.5	1.3
Yield (Kg/ha)	.35	.64	.86	6.3	2.9
Production	.74	1.76	2.64	9.1	4.1
Net exports	.27	.36	.20	2.8	-5.7
Consumption	.44	1.23	2.41	10.7	7.0

In the projections, all of the increase in production is processed for export in value-added form, while annual exports of raw cotton decline by 2000. Projected growth in cotton consumption remains rapid at 7 percent annually, but slower than during the 1980's. The basic assumption is that exports of value-added products will continue to be promoted to the extent feasible, but that protection in world markets will prevent maintenance of the rapid pace achieved in the 1980's.

Pakistan's position as a low-cost producer of both raw cotton and textiles makes the projections sensitive to assumptions on world market conditions. If world prices of raw cotton rise significantly, Pakistan's low costs and irrigated produc-

tion base would permit significantly higher levels of raw cotton production and exports than in the base scenario. Also, if policies in textile importing countries become less restrictive, Pakistan is in a position to significantly expand exports of cotton-based manufactures. This could imply stronger growth in domestic consumption, and smaller raw cotton exports, than in the base scenario.

Rice

The projections indicate that productivity gains and export growth will continue to be limited by weak price prospects in both domestic and foreign markets. Rice production expands slowly, per capita consumption continues to decline because of consumer preference for wheat, and exports grow slowly. The projections assume that incentives for producing basmati and IRRI varieties will be managed to exploit export potential, with a general trend towards a larger share for higher priced basmati varieties in production and exports. There is scope for substantial gains in area and yield of both types of rice if world market prices begin to rise. Domestic demand for rice is expected to remain limited.

Oilseeds and Oils

Edible oil production is expected to remain based principally on cottonseed. Despite projected growth in cotton output, gains in edible oil production are projected to be small relative to consumption, leading to sustained growth in imports (table I-5). Growth in edible oil demand is projected to remain

Table I-5. Pakistan: Base projections for oilseeds and products

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
-----Million tons-----					
---Percent---					
Oilseeds					
Area (Mil. ha)	2.59	3.15	3.46	2.0	.9
Yield (Kg)	.68	1.23	1.29	6.1	.5
Production	1.77	3.88	4.48	8.1	1.4
Net imports	.00	.00	.00	.0	.0
Consumption	1.77	3.88	4.48	8.1	1.4
Crush	1.48	3.21	3.65	8.0	1.3
Per cap. (Kg)	.13	.13	.14	.0	.7
Oilmeals					
Production	.75	1.54	2.06	7.5	2.9
Net exports	.02	.00	.00	-27.2	-100.0
Consumption	.73	1.57	2.08	8.0	2.8
Oils					
Production	.23	.40	.50	5.7	2.2
Net imports	.49	1.05	1.65	7.8	4.7
Consumption	.71	1.43	2.14	7.3	4.1

strong at about 4.1 percent annually, but slow from the rapid pace of the 1980's. The slowdown is driven primarily by the projections for slower growth in incomes. Edible oil price policy is expected to remain consumer oriented, and incentives for illegal exports to India are likely to continue to boost apparent consumption in Pakistan.

Edible oil imports are projected at 1.65 million tons in 2000, up 57 percent from the 1992 base. In the absence of concessions from exporters, the composition of edible oil imports is likely to be determined primarily by relative world prices. This is the case because most domestic and imported oil will continue to be consumed as hydrogenated oil, thus obscuring the taste characteristics of individual oils, and because of the removal of differential that had favored soybean oil. In the recent past, relative prices have heavily favored palm oil, resulting in roughly an 86 percent market share during 1989-1991, compared with 8 percent for soybean oil and 6 percent for rapeseed oil.

Table I-6. Pakistan: Base projections for livestock

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates -----	
				1980-90	1992-00
	-----Million tons-----			---Percent---	
Milk					
Production	9.27	11.97	20.26	2.6	5.4
Net imports	.00	.00	.00	.0	.0
Consumption	9.27	11.97	20.26	2.6	5.4
Per cap. (Kg)	108.8	104.2	136.4	-.4	2.7
Grain fed	.74	.96	1.62	2.6	5.4
Oilmeal fed	.74	.96	1.62	2.6	5.4
Poultry meat					
Production	.05	.22	.49	15.4	8.4
Net imports	.00	.00	.00	.0	.0
Consumption	.05	.22	.49	15.4	8.4
Per cap. (Kg)	.6	1.9	3.3	12.1	5.6
Grain fed	.05	.21	.53	15.4	10.0
Oilmeal fed	.02	.10	.27	15.3	10.0
Eggs					
Production	.03	.08	.11	9.3	3.1
Net imports	.00	.00	.00	.0	.0
Consumption	.03	.08	.11	9.3	3.1
Per cap. (Kg)	.4	.7	.7	6.1	.5
Grain fed	.05	.13	.18	9.3	3.7
Oilmeal fed	.02	.05	.07	9.4	3.8

Sources: USDA and Government of Pakistan

Feed and Livestock

Annual production and consumption of milk, poultry meat, and eggs is projected to expand 5.4 percent, 8.4 percent, and 3.1 percent, respectively (table I-6). In all cases, growth is somewhat slower than in the 1980's, primarily because of expected slower growth in incomes. However, the projections still show substantial gains in per capita consumption, particularly for milk and poultry meat.

Dairy and poultry are projected to account for most growth in feed demand, although a significant portion of domestic feed supplies will continue to be required for the maintenance of draught animals. With the assumed rates of commercialization of milk and poultry production, and apparent feed conversion rates for energy and protein feeds, feed demand for corn is projected to expand at an annual rate of 9.3 percent, while protein meal demand expands 2.8 percent annually.

Given the projected availability of wheat and rice byproduct feeds and projected growth in corn output, feed grain demand is projected to outstrip domestic supply, leading to more than 300,000 tons of corn imports by 2000. However, meal imports will remain negligible because there appears to be significant slack in current supplies as a result of the growth in cottonseed meal availability. Cottonseed meal and other domestic meals are now profitably used in poultry rations.

Effects of Stronger Income Growth

Per capita income in Pakistan may grow faster than assumed in the base projections for a number of reasons. The constraint imposed by weak investment performance could be less significant than assumed, economic reform could be more successful than anticipated in boosting industrial efficiency and investment, or international market conditions could be more conducive to export growth. To evaluate the sensitivity of

Table I-7. Pakistan: Results of high income scenario

	Base scenario	High income	Change
	-----Million tons-----		Percent
Net imports			
Wheat	3.62	4.19	15.7
Corn	.32	.70	120.6
Oilmeals	.00	.31	**
Oils	1.65	1.95	18.2
Net exports			
Cotton	.20	.20	.0
Rice	1.27	1.35	6.3
Production			
Milk	20.26	20.86	3.0
Poultry meat	.49	.56	13.0
Eggs	.11	.13	13.0

the base projections to an alternate income growth scenario, the projected growth rate of real GDP was increased by 1 percentage point.

Results of the high-income scenario indicate, as would be expected, faster growth in consumption and imports of foods and feeds (table I-7). Projected wheat and edible oil import requirements in 2000 increase 16 percent and 18 percent, respectively, but impacts on feeds are even larger. Corn imports more than double from the base scenario, while meal imports rise from zero to more than 300,000 tons. The cotton sector is not affected by the high-income scenario because demand for raw cotton is driven by external rather than internal factors.

Alternative Policy Scenarios

While the base projections incorporate the most likely future developments, it is not possible to project future policies with certainty. Perhaps the key area of policy uncertainty is in the wheat sector and in the tradeoffs between production of wheat and cotton. Particularly with the rapid growth in wheat imports that seems likely under current policies, the government may opt to raise wheat producer prices and/or reduce consumer subsidies. The following alternative scenarios were analyzed:

- In the first scenario ("wheat consumer price reform") government budget subsidies to wheat consumers are eliminated gradually between 1992 and 2000. This might be viewed as the most likely reform, given trends in prices since 1987, and given pressures to reduce government intervention and budget deficits.
- The second scenario ("wheat partial liberalization") incorporates the first scenario and also raises wheat producer prices closer to world prices by 2000. The assumed price increase covers half the gap between the current internal price and the projected border price in 2000. This scenario is intended to represent the most aggressive package of wheat price reforms that would be politically feasible.
- The third scenario ("wheat and cotton partial liberalization") incorporates the second scenario, plus a similar adjustment in cotton producer prices. This scenario permits evaluation of how wheat sector reforms could be affected by price adjustments that the government may also make in order to maintain the relative profitability of cotton.

The results, shown in table I-8, first indicate that consumer price reform reduces consumption by only 1 percent and imports by 5 percent in 2000. The impacts of subsidy removal are minor because differences between government and average open market prices are now relatively small. Partial liberalization of producer and consumer prices of wheat, however, has significant impacts on wheat supply, demand, and trade. Wheat production is up 7 percent from the base case, consumption falls 5 percent, and imports drop nearly 70 percent. Larger effects in this scenario are driven by the relatively wide gap between domestic and import parity prices.

Table I-8. Pakistan: Results of policy reform scenarios

	Base scenario	Wheat consumer price reform	Wheat partial liberal- ization	Wheat and cotton partial liberal- ization
Million tons				
Wheat				
Production	18.30	18.30	19.54	18.50
Net imports	3.62	3.43	1.15	3.25
Consumption	21.83	21.64	20.69	21.76
Rice				
Production	3.35	3.35	3.01	2.92
Net imports	-1.27	-1.27	-1.37	-1.08
Consumption	2.09	2.09	1.84	1.84
Corn				
Production	1.40	1.40	1.50	1.50
Net imports	.32	.32	.21	.21
Consumption	1.71	1.71	1.71	1.71
Cotton				
Production	2.64	2.64	2.54	2.61
Net imports	-.20	-.20	-.12	-.20
Consumption	2.41	2.41	2.41	2.41
Oilseeds				
Production	4.48	4.48	4.23	4.31
Net imports	.00	.00	.00	.00
Consumption	4.48	4.48	4.23	4.31
Oilmeals				
Production	2.06	2.06	1.95	1.98
Net imports	.00	.02	.11	.09
Consumption	2.08	2.08	2.08	2.08
Oils				
Production	.50	.50	.47	.48
Net imports	1.65	1.65	1.68	1.66
Consumption	2.14	2.14	2.14	2.14

A key cross-commodity effect of wheat price liberalization in the second scenario is reduced production, consumption, and exports of cotton. Policy makers may find this an unacceptable tradeoff and opt to also raise cotton prices to maintain relative profitability. In this event, the third scenario results indicate that gains in wheat output would be dissipated by competition with cotton. As a result, there is only a small reduction in wheat imports associated with lower consumption, while cotton production, use, and trade return to base scenario levels. Overall, the third scenario generates higher producer returns, budgetary savings from lower wheat subsi-

Table I-9. Pakistan: Production impacts of reduced irrigation supply

	Base scenario	Reduced irrigation water	Change
	Thousand tons		Percent
Wheat	18,298	18,090	-1.1
Rice	3,350	3,274	-2.3
Corn	1,395	1,353	-3.0
Cotton	2,635	2,541	-3.6
Oilseeds	4,476	4,315	-3.6
Oilmeals	2,060	1,985	-3.7
Oils	497	479	-3.6

dies, and a net gain in foreign exchange, but entails reduced consumption at higher consumer cost.

Impacts of Reduced Water Availability

The base projections incorporate no explicit impacts on future area or yield growth from the low rate of investment in agriculture that occurred in the 1980's, and may continue to occur in the early 1990's. It is particularly difficult to evaluate the potential impacts of low investment in areas such as seed production, fertilizer distribution, or research and extension. However, it is possible to test the sensitivity of the projections to changes in the supply of irrigation water and irrigated land that could be associated with changes in investment.

The base projections explicitly account for changes in irrigated area and water supply in determining crop areas and yields. In the base scenario, both variables were projected to remain on their long-term (1972-1989) trends. In the alternative scenario, growth in each variable was slowed by 0.5 percent, a change roughly consistent with what was observed during 1984-1988. The results, shown in table I-9, indicate relatively minor changes in production in 2000 compared with the base projections. Production of cotton and associated oilseeds and products are the most sensitive, reflecting the fact that cotton has accounted for a large share of increases in gross irrigated area. While the impacts tend to be small, the results constitute only a very partial analysis of the potential supply affects of reduced investment.

Implications for U.S. Trade

The projections indicate that Pakistan is likely to be a growing market for wheat and edible oils during the 1990's. In both cases, import growth will stem from rising incomes and, given expected developments in domestic policy and commodity prices, limited production potential. These factors are also

likely to lead to rising imports of corn, although poor data make it difficult to project the magnitude.

While imports of wheat, corn, and edible oils are expected to rise, the projections indicate that Pakistan's now important role as an exporter of rice and raw cotton is unlikely to expand. Growth in exports of basmati rice are projected to be mostly offset by smaller exports of coarse rice, at least under the assumption of continued low world prices. In the case of cotton, production is expected to show strong growth even with low world prices, but all or most of the increased supplies are expected to fuel continued rapid growth in exports of cotton-based textiles. However, Pakistan is likely to remain a highly competitive producer of both cotton and rice, with capacity to expand exports if world prices strengthen.

The analysis suggests that these trends in farm trade are likely to be sustained even under alternative scenarios for key variables. Growth in imports could be significantly enhanced if relatively high income growth rates can be sustained or, possibly, if the climate for domestic agricultural investment remains weak. Policy makers have scope to alter the trade outlook by raising domestic prices of wheat, cotton, or rice closer to world prices, thus reducing the policy bias favoring consumers. However, production tradeoffs between wheat and cotton, as well political sensitivity to raising consumer prices, may prevent shifts that would significantly affect the trade projections. While protectionist measures could reduce projected imports of wheat, feeds, or oils, their adoption seems unlikely because of adverse consumer welfare implications and the current reform environment.

Projected import growth may generate limited direct benefits for U.S. exports. The U.S. market shares for wheat and edible oils have fallen recently because of the decline in U.S. bilateral assistance and access to concessional programs. With less U.S. aid, government and private wheat importers are giving priority to price, quality, and credit availability, resulting in a reduced U.S. marketing edge. Similarly, less concessionality in U.S. programs and lower landed prices for palm oil have virtually halted U.S. soybean oil exports to Pakistan. In the case of corn and soybean meal, U.S. prospects may be limited by lack of advantage in competitively providing the relatively small shipments likely to be demanded as imports emerge.

The benefits to U.S. trade of limited projected growth in Pakistan's exports of rice and cotton may also be small. First, the projections are predicated on the outlook for continued weak world prices for these commodities. If prices strengthen, Pakistan, as a low-cost producer, will also be in a position to expand exports. Second, in the case of cotton, the projected sustained rapid growth in Pakistan's exports of indigenous cotton yarn and textiles will likely continue to undermine growth in world import demand for U.S. raw cotton.

Asia's Farm Markets

The rankings of Asia's major agricultural importers have remained relatively stable since the early 1970's. Japan and the newly industrialized countries (NIC's) of East Asia—with their relatively high incomes and limited agricultural resources—and China—with its large population—continue to account for the bulk of Asian farm imports.

The same group of countries, Japan, the NIC's, and China, have also consistently accounted for most U.S. farm exports to Asia. Also ranking high as U.S. markets are several lower income countries, including Pakistan and the Philippines, where sales have been boosted by export programs. In contrast to the 1970's, the U.S. market share fell in most Asian countries and the region in the 1980's. The U.S. share remains relatively large in key markets like South Korea, Taiwan, and Japan, and relatively small in Southeast Asia and China.

These are key questions in the outlook for U.S. sales to Asia.

- Will growth in farm import demand in the large East Asian markets continue to slow and, if so, will U.S. products be able to sustain or improve market share in these countries?
- If growth in Asian farm import demand shifts towards the rapidly developing economies of Southeast Asia and China, will the United States be able to boost its traditionally low market share in these countries?
- To what extent will U.S. commercial and concessional export programs be important in maintaining or improving the competitiveness of U.S. products, including value-added products, in Asia?

Total farm imports of selected Asian countries

	1969-	1979-	1988-	Growth rate	
	1971	1981	1990	1970's	1980's
	----- \$ million -----			Percent	
Japan	4,030	17,519	28,175	15.8	5.4
Hong Kong	684	3,034	6,284	16.1	8.4
South Korea	468	3,457	6,047	22.1	6.4
China	504	5,143	5,966	26.1	1.7
Taiwan	304	2,294	4,238	22.4	7.1
Singapore	403	1,922	3,258	16.9	6.0
Malaysia	300	1,339	2,012	16.1	4.6
Indonesia	237	1,517	1,511	20.4	.0
India	667	1,356	1,427	7.4	.6
Thailand	97	557	1,302	19.1	9.9
Pakistan	142	791	1,283	18.7	5.5
Philippines	175	623	1,155	13.5	7.1
Bangladesh	211	483	825	8.6	6.1
Other East Asia	108	449	606	15.3	3.4
Other Southeast Asia	400	802	677	7.2	-1.9
Other South Asia	215	570	809	10.2	4.0
Total	8,945	41,856	65,575	16.7	5.1

Source: Food and Agricultural Organization of the United Nations

Note: Ranked by trade in 1988-1990.

U.S. farm exports to selected Asian countries

	1969- 1971	1979- 1981	1988- 1990	Growth rate	
				1970's	1980's
	-----	\$ million	-----	Percent	
Japan	1,076	6,019	8,969	18.8	4.5
South Korea	253	1,750	2,591	21.3	4.5
Taiwan	135	1,107	1,803	23.4	5.6
Hong Kong	76	498	1,025	20.7	8.4
China	0	1,719	1,017	N/A	-5.7
Pakistan	86	178	438	7.5	10.5
Philippines	76	298	353	14.6	1.9
Singapore	18	159	277	24.3	6.4
Indonesia	109	381	245	13.3	-4.8
India	263	352	232	3.0	-4.5
Thailand	37	167	213	16.3	2.7
Bangladesh	0	144	133	N/A	-9
Malaysia	16	105	120	20.7	1.5
Other East Asia	0	0	1	N/A	N/A
Other Southeast Asia	135	12	6	-21.5	-7.4
Other South Asia	15	47	96	12.1	8.3
Total	2,295	12,936	17,519	18.9	3.4

Source: U.S. Dept. of Commerce, Bureau of the Census.

Note: Ranked by trade in 1988-1990.

U.S. share of selected Asian country agricultural imports

	1969-1971		1979-1981		1988-1990	
					Percent	
South Korea	54		51		43	
Taiwan	44		48		43	
Pakistan	61		23		34	
Japan	27		34		32	
Philippines	43		48		31	
China	0		33		17	
Thailand	38		30		16	
Hong Kong	11		16		16	
India	39		26		16	
Indonesia	46		25		16	
Bangladesh	0		30		16	
Singapore	4		8		9	
Malaysia	5		8		6	
Other East Asia	0		0		0	
Other Southeast Asia	34		1		1	
Other South Asia	7		8		12	
Total	26		31		27	

Sources: U.S. Dept. of Commerce, Bureau of the Census and Food and Agricultural Organization of the United Nations

Note: Ranked by share in 1988-1990

Philippines

Kim Hjort and Liana Neff

Abstract: Economic growth is expected to strengthen significantly in the 1990's. Rising demand, combined with more liberal trade policies, is expected to lead to robust growth in imports of wheat, rice, corn, soybeans and products, and cotton.

Keywords: Philippines, agriculture, economic reforms, policy, trade, wheat, rice, corn, oilseeds and products, pork, cotton.

Introduction

During the 1980's, income growth in the Philippines lagged behind that of most other Southeast Asian nations, leading to increased domestic and foreign debt and reduced investment and aggregate import demand. However, agricultural imports increased steadily, in large part because of more wheat purchases following trade liberalization in 1987. Agricultural trade reforms—particularly for corn—are expected to continue, expanding opportunities for U.S. exports to the Philippines.

Agriculture's contribution to Gross Domestic Product (GDP) is declining, and the agricultural trade balance is shifting from surplus to deficit. Historically, agricultural trade has been an important foreign exchange earner for the Philippines. However, since the late 1980's, farm exports—primarily coconut products, bananas, pineapple, coffee, and tea—have stagnated.

The Philippines is the 12th largest agricultural market in Asia, and the seventh largest U.S. market there. In fiscal 1992, the United States shipped \$443 million worth of agricultural goods to the Philippines, or about 30 percent of their farm imports. Wheat is the principal U.S. farm export to the Philippines, followed by soybean meal and cotton. Growth in farm import demand in the 1990's will depend heavily on the progress of ongoing macroeconomic reforms, as well as developments in agricultural policy and farm productivity.

Economic Trends and Policies

During the 1970's, the Philippine economy grew at an annual average of about 5.5 percent. In the 1980's, however, growth fell below 2 percent and per capita income dropped in real terms (see table J-1). This poor performance was due primarily to economic policies that increased domestic debt and limited investment opportunities. Under International Monetary Fund (IMF) reform programs, the economy began to recover in the late 1980's, growing about 6 percent per year, with inflation stabilizing near 10 percent a year. However, severe natural disasters in 1990 and 1991 exacerbated the debt and investment problems, reduced income growth to less than 1 percent, and increased inflation.

After growing by a little more than 9 percent annually in the 1970's, average real investment declined in the 1980's. This was an indirect consequence of the fast accumulation of domestic debt, combined with a slowdown in foreign assistance. In addition, legislation limited foreign equity and restricted investment. However, recent policy changes will reverse the trend in investment.

Table J-1. Philippines: Macroeconomic indicators

	1970- 1971 avg.	1979- 1981 avg.	1989- 1991 avg.	Growth rates	
				1970's	1980's
				-----	-----
	--Billion 1987 pesos--			-Percent-	
GDP	392.4	671.2	783.9	5.5	1.6
Investment	83.1	200.2	166.5	9.2	-1.8
CPI (1987=100)	10.6	37.4	138.1	13.4	14.0
Government deficit	.9	13.5	27.6	30.9	7.4
Domestic debt	37.5	53.6	209.7	3.6	14.6
Percent of GDP	9.5	8.0	26.8	--	--
	--Billion 1987 US\$--				
Exports	6.7	7.8	11.7	1.5	4.1
Imports	7.2	9.4	13.1	2.8	3.3
Foreign debt	5.7	20.4	25.5	13.6	2.3
Percent of GDP	1.5	3.0	3.2	--	--
Exchange rate (Pesos/US\$)	6.2	7.6	24.5	2.1	12.4
Population (Mil.)	39.2	50.9	64.4	2.6	2.4

Source: World Bank and USDA.

Trade and Trade Policy Developments

The Philippines exports about \$12 billion of goods and services annually, primarily electrical items, garments, and copra products. Export growth improved significantly following trade reforms in the late 1980's and devaluation of the peso in 1990. Agricultural exports, mostly copra products and fruits, account for 16 percent of all exports, but earnings are declining.

Growth in Philippine imports had been consistent, averaging 2-3 percent per year since the early 1970's. But, growth has moderated since 1990 with the devaluation of the peso and a temporary import surcharge levied to conserve foreign exchange. Primary imports include mineral fuels, lubricants and related materials, and machinery.

The Philippines is removing or reducing import restrictions on a wide variety of nonagricultural products, and dropped almost all quantitative limits in 1992. However, agricultural trade policy remains less open in order to shield Philippine producers from fluctuations in world prices and conserve foreign exchange. Tariffs on corn, sugar, livestock, and meat products have been increased sharply to two or three times their previous levels, although they are slated to be reduced slowly over the next 5 years.

Agricultural Trends and Policies

Agriculture accounts for about 26 percent of GDP. Rice is the most important crop, both in terms of producer revenue and domestic consumption. After rice, the most important commodities in the Philippine diet are wheat, corn, fish, pork, and poultry. Also important are coconut and sugarcane. The coconut industry is the most important agricultural export sector. Philippine agricultural growth slowed considerably in the 1980's (table J-2). Key factors were poor overall economic performance, reduced investment, and a slowdown in the introduction of higher yielding varieties of rice.

Trends in Grain Supply and Demand

The Philippine Government pursues self-sufficiency in rice, in large part by constraining imports and consumption. Per capita consumption of rice peaked at about 102 kilograms in 1988. Consumption is now about 95 kilograms per capita, reflecting the real decline in per capita income during the 1980's, as well as some substitution of wheat and other foods for rice. As income growth recovers, rice consumption should grow, but further diet diversification should keep the pace of growth slower than during the early 1980's.

Since 1960, growth in area harvested for rice has been minimal; most of the gains in production have come through yields. Yields grew much faster in the 1970's than in the 1980's. By the latter period, most farmers had adopted improved varieties and expansion in irrigated area had slowed. The International Rice Research Institute reports no new varieties capable of increasing yields at the rate of those introduced in the 1960's and the 1970's. Producers can increase yields with older varieties through improved cultivation practices. However, with slower expansion in irrigated area and adoption of high

Table J-2. Philippines: Growth in agricultural production, consumption, and imports

Commodity	1960's	1970's	1980's
-----Percent per year-----			
Production			
Rice	3.1	4.4	1.7
Corn	5.0	4.7	4.0
Copra	N/A	2.0	.5
Soybeans	N/A	25.9	1.6
All crops	N/A	3.5	.2
Pork	6.4	1.0	4.7
Consumption			
Rice	3.2	3.6	2.2
Corn	5.2	5.4	3.6
Food	4.5	2.9	3.0
Feed	6.5	9.1	4.1
Imports			
Wheat	4.3	3.5	5.5
Corn	N/A	13.4	-4.0
Soybeans	N/A	24.0	18.6
Soybean meal	N/A	17.7	7.6

Source: USDA and Philippine Department of Agriculture.

yielding varieties, growth in rice production likely will not meet rising demand.

Production gains in corn will likely match greater demand. Corn is both a source of food on southern islands and a principal feed component for the rapidly growing poultry and swine industries. Per capita corn food use has been falling since the early 1970's and is now surpassed by feed use. Corn area has nearly doubled since 1960, and in 1985 it surpassed rice area. Corn yields have grown steadily at 2-3 percent per year since 1960. The strong growth in production has resulted in a persistent decline in net corn imports.

In contrast to rice, there is great potential for increasing corn production through area and yield expansion. More corn area could be planted, but at the expense of low-yielding non-staple crops and, possibly, rice. The greatest potential for production increases is in yields. More widespread use of hybrid seed, currently planted on only 10 percent of corn area; fertilization at recommended rates; and improved use of irrigation could greatly increase yields.

Urban consumers are supplementing their diets with wheat products. Wheat is not produced commercially in the Philippines, so all demand is met through imports. Per capita wheat consumption was largely constant until the late 1980's when the wheat market was deregulated. Beginning in 1987, millers were permitted unlimited imports subject only to a 10 percent tariff. Initially, domestic wheat prices rose, but then

fell as more competition among importers led to higher imports. Per capita consumption has nearly doubled.

Trends in Cotton Supply and Demand

The domestic and export garment businesses depend almost entirely on imports of raw cotton and cloth, since domestic cotton production is very small. Cotton area has been growing at about 5 percent annually, yields have been constant, and production remains below 20,000 tons. Cotton imports grew much slower in the 1980's than in the 1970's, a byproduct of the shortage of efficient textile manufacturing mills. The shortage of mills favors imports of yarn and textiles over raw cotton.

Trends in Oilseed Supply and Demand

Coconut and its byproducts (copra, coconut oil, and copra meal) are the primary agricultural foreign exchange earners. The Philippines is the world's largest producer of coconut oil and exporter of coconut products. Oil is derived from crushing copra, the meat of the coconut. Production of copra has stagnated, because yields of existing trees are declining and new plantings have not matured. Copra crush has remained steady while exports have declined. As a result, oil production has been about constant, and since consumption has been rising, exports declined by a little more than 3 percent per year.

Few oilseeds other than copra are produced in the Philippines. However, domestic consumption of meals as protein feed ingredients is rising, leading to growing imports of both soybeans and soybean meal. Following the opening of a commercial crushing plant at the end of the 1980's, soybean imports expanded sharply from a minimal constant base. Soybean meal imports have grown more steadily, rising 6 percent annually. Growth in soybean and meal imports will continue to rise with domestic meat production, with the mix between soybeans and meal dependent on gains in crush capacity.

Trends in Meat Supply and Demand

Pork has been the major meat consumed in the Philippines although production of chicken meat is expanding rapidly. The pork sector is highly susceptible to income fluctuations. During the late 1970's, the sector began a fast paced recovery which was dampened by the economic downturn in the early to mid-1980's. Production has since recovered, as breeding stock improved and feed prices stabilized.

Pork consumption depends on fluctuating domestic supplies since the government has strict quantitative limits on imports. Per capita consumption has ranged from less than 7 kilograms annually in the late 1970's to as much as 10.5 kilograms at present.

Producer Price Policies

Producer incentives for rice and corn include price supports in the form of procurement prices, fertilizer and other input subsidies, and development of irrigation and infrastructure. As the biggest contributors to increased agricultural produc-

tion, expanded irrigation capacity and infrastructure will be crucial to growth.

The National Food Authority (NFA) encourages production and isolates farmers and consumers from world rice and corn prices by procuring and reselling grain in the domestic market. The NFA acquires grain by offering a procurement price to producers to assure income stability, stimulate production, and attract stocks into government warehouses. In addition, controls on trade prevent changes in world prices from directly affecting producer prices and make the procurement price attractive in surplus years. In the past, the procurement price was a floor in the market. In recent years, however, budget constraints have prevented the NFA from procuring all rice offered by producers and the procurement system has not provided an effective price floor.

The procurement price has been set at a level that assures consumer access to rice at a cost compatible with income. This has meant that rice producer prices are below world prices, recently by 20 to 40 percent. Since real world rice prices are expected to gradually decline, holding real domestic support prices constant or increasing them slightly will bring them more in line with world prices and maintain incentives to rice producers. However, since higher support prices will mean higher consumer prices, there is a practical limit to how high support prices can be raised, from both a fiscal and a political perspective.

Corn producer and trade policies are now under substantial pressure for change. Producer prices have gradually risen, ranging between 5 and 35 percent above border prices since the mid-1980's. Domestic prices have been kept above world prices through import restrictions. Although implementation is now stalled, the government had planned to lift quantitative import restrictions, raise the tariff initially from 20 to 75 percent, and then gradually reduce the tariff to 20 percent by 1996. With this plan, the market price would reflect the import price, procurement activities would stop, and declining market prices would bolster feed demand by the mid-1990's. For production to keep pace with demand increases, returns to producers must rise. Since prices are likely to fall, accelerated yield growth will be essential in meeting the expected increased demand for corn.

There are no government producer policies for copra and products, oilseeds, and other crops. Since the Philippines is a low cost producer of copra and products and they are nonessential foods, the government avoids disincentives to exporting, and on occasion supports production enhancing programs. Meat producers are protected by strict controls on imports, as well as import tariffs. These variables keep domestic meat prices high, enabling expansion of cattle, swine, and poultry inventories.

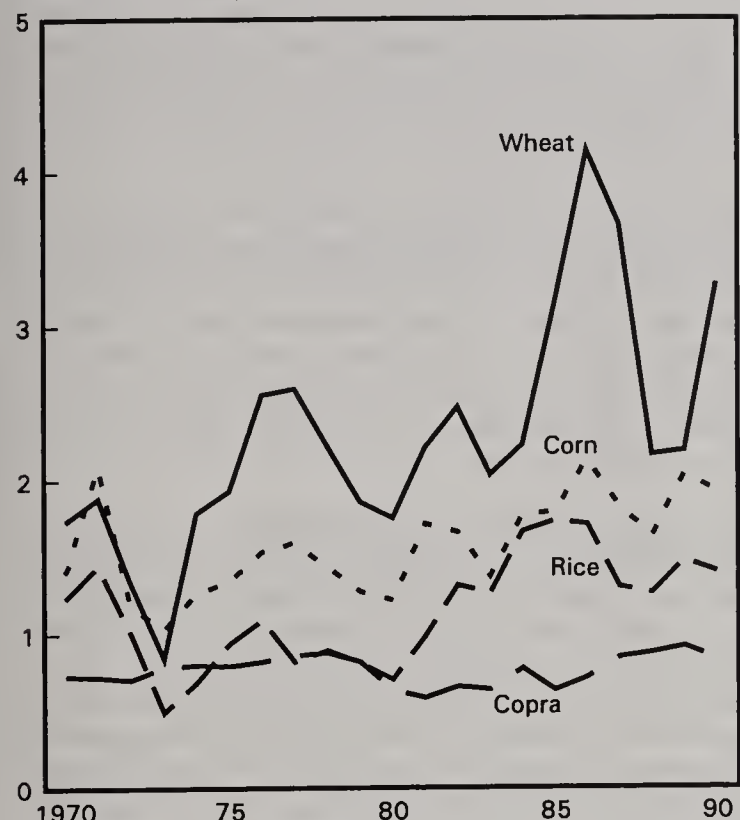
Input and Infrastructure Policies

Producers are subsidized through a variety of tools. An important one is the fertilizer subsidy—rice and corn producers receive one free 50-kilogram bag of urea for every two bags purchased. The program is effective only when urea prices are low relative to rice and corn prices. This has occurred

Figure J-1

Philippines: Consumer Prices Relative to Border Prices

Ratio of consumer prices to border prices

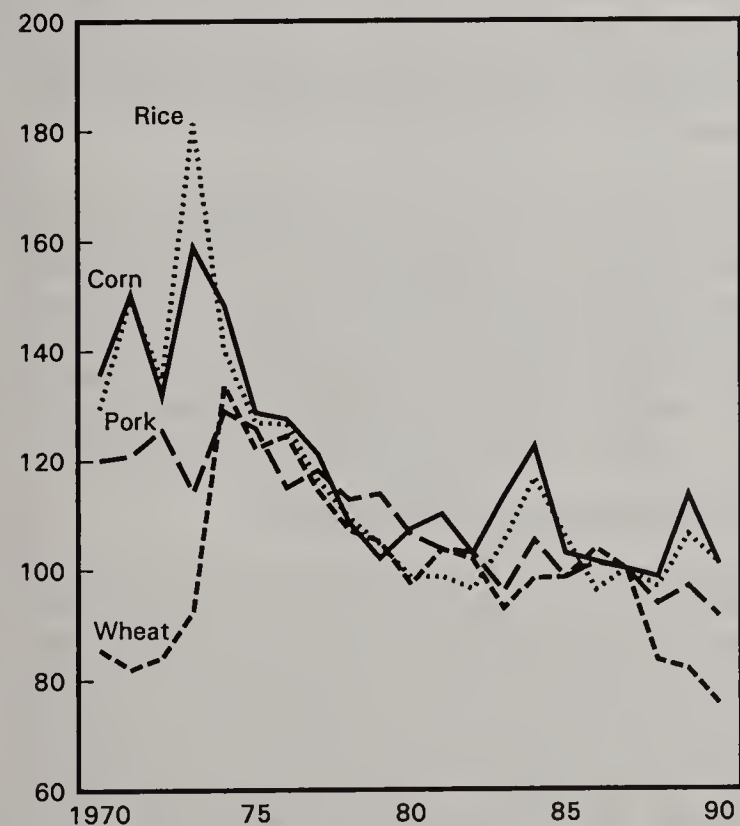


Source: Government of the Philippines

Figure J-2

Philippines: Real Consumer Prices

1987 = 100



Source: Government of the Philippines

less frequently in recent years, especially in the case of corn. If fertilizer prices rise relative to corn or rice prices, this program is unlikely to have a significant positive impact on fertilizer use and yields. With increasing fiscal pressure to reduce expenditures on input subsidy programs, increases in use of other inputs may be slowed.

About one-third of total agricultural land is irrigated. Expansion in irrigated area has slowed, but still grew by an average 2.8 percent a year in the 1980's. The general consensus now is that the potential for expanding irrigated area is limited. Few irrigation systems are being built and many of the existing ones are silting up faster than they can be cleaned. Future expansion will be in the form of small scale, shallow-well irrigation.

Rural infrastructure is very poor; it cannot handle much expansion in agricultural marketing. An increasing percentage of farms do not have access to farm-to-market roads. Less than 50 percent of the road system meets all weather standards. Machinery and vehicles are relatively expensive. Electricity supply is erratic—three of the five major power plants in the country are inoperable, or operating at well below capacity, because financial constraints make repairs difficult. Unless infrastructure can be improved, these factors will hamper sustained growth in agriculture and the rest of the economy.

Although most corn is now used for feed rather than food, development of the feed industry is constrained by location and infrastructure problems. Most corn is grown on southern islands while most feed manufacturing plants are located on the largest northern island. It can cost more to ship corn from island to island than import it from the United States. For domestic corn to be competitive with imported corn, the transportation system must be improved.

Consumer Policies

Consumer prices of principal farm imports, such as grains and meats, are generally above world prices while the prices of copra and products, the principal farm exports, are below world prices (figure J-1). Rice consumer prices are usually 30-40 percent above border prices, corn prices are nearly double border prices, and copra product prices differ from world prices by the cost of transporting the products to export destinations.

Domestic wheat prices rose in real terms in the mid-1980's, when millers formed a buying cartel and set domestic prices. However, as the number of wheat millers increased, competition lowered prices relative to the border price during the late 1980's and early 1990's. However, profit and cost margins in wheat milling remain relatively high. Real prices of rice and corn are rising, a reflection of the failure of government policies in recent years (figure J-2). Real meat prices, as measured by the pork consumer price, are about constant.

The government will continue to limit rice price increases by shipping and storing NFA-held rice throughout the country, and releasing stocks in a calculated fashion into the market.

This system is not fully effective in limiting price rises, mainly because consumers believe non-government supplied rice is of better quality and will buy it before NFA-procured rice.

Retail price controls have limited upward movement in prices of essential goods. The most recent controls were from December 1989 to mid-1991. Prices were set for eight major consumer commodities, including wheat flour, pork, chicken meat, rice, and milk. The supply of staples increased gradually, leading to a natural stabilization in domestic retail prices and removal of controls. An increasing market orientation of the government also contributed to the removal of ceilings. Freer markets will continue to be a goal, but if the retail price of rice or other essential goods rises to unacceptable levels, political pressure may lead to a return of controls.

Issues Affecting Agricultural Trade in the 1990's

There are many uncertainties underlying the agricultural outlook in the Philippines. Some key elements are economic performance, agricultural policy reform, investment, and the rate of growth in agricultural productivity.

Economic Growth Prospects

GDP growth is expected to be constrained through the remainder of the 1990's by high debt, inflation, and economic restructuring. At least through the mid-1990's, economic growth will depend heavily upon increases in foreign assistance, investment, and public savings, as well as continued support for debt reduction efforts by foreign commercial banks. Expansion in exports of nontraditional goods, such as electronics and garments, and lower imports, will be essential. And, substantial improvements in infrastructure (power and transport) must be made. It is assumed that moderate progress will be made on these fronts, leading to an average income growth rate of 4.8 percent annually and investment growth of 3.5 percent annually during the 1990's.

Liberalized trade and domestic investment laws could increase income growth faster than projected. Coupled with continued population growth, increased income exerts upward price pressure on agricultural staples. Therefore, in the absence of production response to higher prices, income growth could increase the need for imports, and present the Philippines with an even more fiscally challenging problem as it balances self-sufficiency goals with rising demand.

Agricultural Policy Reform

The Philippines is gradually liberalizing agricultural pricing and trade policies. Wheat policies were reformed in 1986, and corn sector reforms are now under consideration. While there has been no active discussion of liberalizing the rice sector, there may be significant production gains associated with changes in rice price policy.

Despite the current delays in implementation, it is expected that corn sector reforms similar to those now under consideration will be enacted. These include suspension of the

procurement price, removal of quantitative import restrictions, and establishment of a higher tariff to be gradually reduced to 20 percent by 1997/98. In the next few years, these changes are expected to increase corn producer prices from the present level of 30-40 percent above border prices to about 75 percent above border prices. In the longer term, producer prices will decline gradually to roughly 20 percent above border prices by the late 1990's.

The 20 percent tariff that would remain by 2000 would provide some protection for corn producers but tax the domestic feed-livestock industry, raise prices, and slow growth in demand for livestock products. To strengthen incentives for domestic livestock production, the government could opt to allow domestic corn prices to fall towards world prices. Therefore, the impacts of eliminating the 20 percent tariff by the late 1990's are also examined.

Another possible policy change is liberalization of the rice market. Although per capita demand for rice can be expected to slow somewhat as rising incomes lead to more diverse diets, the Philippines may not produce enough rice under current policies to satisfy growth in total demand. Since producer prices are well below world prices, procurement prices could be raised and trade opened. These changes would likely raise consumer prices, at least in the near term. Demand could fall, production could rise, and the need to import rice could be averted.

Investment in Irrigation

In some Asian countries, rice has become an inferior food as incomes rise, eventually leading to a decline in per capita and, perhaps, total rice demand. In the Philippines, a slowdown or decline in rice demand would reduce the need for irrigation investment targeted at rice production. These funds could be saved for nonagricultural investment or be diverted to other crops, such as corn or export crops, where potential for growth in production and export earnings is high.

Future trends in rice demand and the appropriate government investment policy are topics of debate. It is likely, however, that rice is not yet an inferior food and consumption will continue to rise. Hence, a reduction in irrigation development that slows growth in rice production is likely to increase rice import needs. In the end, any savings in investment expenditures may be negated as scarce foreign exchange is used to buy rice rather than growth-promoting investment goods.

Increasing Agricultural Productivity

Yields for many agricultural products, such as rice, corn, and copra, are well below potential levels. Rice yields are about 1.8 tons per hectare, compared to 2.8 tons in Indonesia, and 3.9 tons in China. The same differentials can be found in corn yields. Yields are about 1.3 tons per hectare, compared to 1.8 tons in Indonesia and 4.3 tons in China. In order to increase crop productivity, more hybrids suited to the Philippine climate need to be planted, more efficient and greater use of irrigation must be made, and other production practices

need to be improved. Many of these changes may be relatively easy to introduce in the corn sector, and could affect corn yield growth in the 1990's.

Agricultural and Trade Prospects to 2000

The fastest changing sectors in the 1990's will be wheat, corn, soybeans, and soybean meal. Wheat imports are projected to grow faster than in the 1980's. Corn production will expand, but will begin to fall behind consumption increases by the end of the decade. Soybean production will expand sharply, but not fast enough to keep up with demand. Soybean meal

Table J-3. Philippines: Base projections for crops

				Growth rates	
	1979- 1981 avg.	1989- 1991 avg.	2000	----- 1980-90	1992-00
	-----Million tons-----			---Percent---	
Wheat					
Net imports	.85	1.46	2.54	5.5	5.7
Consumption	.86	1.42	2.54	5.2	6.0
Food	.86	1.41	2.50	5.09	5.91
Per cap.(Kg)	16.87	21.89	32.20	2.64	3.93
Feed	.00	.01	.04	N/A	10.72
Rice					
Area (Mil. ha)	3.51	3.39	3.62	-.4	.7
Yield (Tons/ha)	1.46	1.79	2.00	2.1	1.1
Production	5.13	6.04	7.23	1.7	1.8
Net imports	-.14	.31	.38	N/A	2.2
Consumption	5.00	6.20	7.57	2.2	2.0
Per cap.(Kg)	98.22	96.35	97.36	-.2	.1
Corn					
Area (Mil. ha)	3.27	3.66	4.19	1.1	1.4
Yield (Tons/ha)	.97	1.28	1.68	2.8	2.8
Production	3.17	4.68	7.05	4.0	4.2
Net imports	.24	.16	.55	-4.0	13.0
Consumption	3.44	4.87	7.59	3.5	4.5
Food	1.80	2.41	2.60	3.0	.7
Per cap.(Kg)	35.35	37.91	33.37	.7	-1.3
Feed	1.64	2.46	5.00	4.1	7.3
Cotton					
Area (Mil. ha)	.01	.02	.04	5.4	4.8
Yield (Tons/ha)	.35	.34	.41	-.3	1.7
Production	.00	.01	.01	7.2	5.8
Net imports	.02	.05	.06	8.8	2.1
Consumption	.03	.06	.08	7.8	3.1
Per cap.(Kg)	.53	.88	.99	5.2	1.2

imports will continue to rise, but not as fast as in the 1980's. The rice and coconut oil markets are expected to be relatively stable, although slower growth in production is expected to lead to larger rice imports and smaller coconut oil exports.

Wheat

Following the liberalization of the wheat industry in 1986, imports grew rapidly and are expected to follow this trend through 2000 (table J-3). With growth in the domestic milling and baking industries leading to more competition among firms, the price of wheat is likely to continue to fall, narrowing the gap between domestic and world prices. In addition, as consumers become more familiar with wheat products, demand is expected to rise, especially relative to the staple foods of rice and corn. Imports averaged 1.5 million tons during 1989-91 and are expected to increase almost 60 percent, reaching 2.5 million metric tons. The growth rate matches that of the 1980's.

Rice

Unless producer prices rise substantially, there is little likelihood of expansion in rice area, even with continued investment in irrigation facilities and improved cultivation practices. Since a slight decline in real rice prices is expected, incentives to plant area to rice will fall, resulting in area growth of only 0.7 percent per year (see table J-3). Although minor, the growth in area is stronger than in the 1980's, when rice area actually declined. Yields will grow at a slower pace than in the 1980's as relative input costs rise and expansion in irrigated area slows. Overall, rice production will rise a little faster than in the 1980's, but not as fast as population.

Consumer rice prices are expected to remain roughly constant in real terms, while wheat and other food prices are expected to decline relative to rice. Thus, both diet diversification and relative price movements are likely to reduce per capita rice consumption. These shifts are expected to only partially offset the effects of income and population growth and rice consumption is projected to rise by 2 percent annually. Growth in demand is projected to exceed production growth, leading to a doubling of imports by 2000.

Corn

Real corn prices, which are expected to increasingly reflect world prices, are expected to continue to fall, but not as fast as those of competing crops. Therefore, corn area will continue to expand, surpassing the average growth in the 1980's (see table J-3). Yields are expected to increase at the same rate as in the 1980's, possibly faster, depending on seed availability and cost. Overall, production is expected to rise faster than in the 1980's.

Consumer prices of corn have been artificially high, relative to world prices, because of government limitations on imports. Under the anticipated corn trade/support policy, imposition of a high tariff would initially distort domestic corn prices, followed by downward adjustments in the mid- and late

1990's. This price pattern would result in an average increase in total consumption of 4.5 percent annually, a full point faster than in the 1980's.

Since corn is considered an inferior grain for food use, food use will decline, while more is fed to livestock, especially toward the end of the decade. Higher corn prices would slow livestock production in the near term, but a declining tariff would eventually lower feed manufacturing costs and bolster output of livestock products. Use of corn for feed, on average, is projected to rise at almost twice the 1980's rate, leading to a resurgence in corn imports.

Cotton

Cotton area is expected to continue to grow at about the same rate as in the 1980's while yields are expected to reverse the 1980's trend and rise slightly. However, production is expected to remain relatively small and imports will still be needed. Mill demand and import growth will continue to slow unless mill capacity rises significantly.

Oilseeds and Products

Soybean area is expected to expand by nearly 12 percent annually, to 43,000 hectares. Yields are not expected to improve significantly, so production will rise only a little faster

Table J-4. Philippines: Base projections for oilseeds and products

				Growth rates	
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1990-00
	avg.	avg.			

	-----Million tons-----			---Percent---	
Soybeans					
Area (Mil. ha)	.01	.01	.04	3.4	11.9
Yield (Tons/ha)	.97	.81	.88	-1.8	.8
Production	.01	.01	.04	1.8	12.2
Net imports	.01	.08	.33	18.9	15.4
Consumption	.02	.09	.37	18.0	15.2
Soybean meal					
Production	.01	.05	.27	26.4	18.0
Net imports	.28	.59	.91	7.6	4.4
Consumption	.27	.65	1.16	9.0	6.0
Per cap.(Kg)	5.37	10.04	14.92	6.5	4.0
Coconut oil					
Production	1.16	1.27	1.26	.9	-.1
Net exports	.97	.93	.66	-.4	-3.4
Consumption	.19	.40	.59	8.0	4.1
Per cap.(Kg)	3.63	6.17	7.62	5.5	2.1

Table J-5. Philippines: Base projections for pork

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1990-00	
	-----Million tons-----			---Percent---	
Slaughter (Mil. hd)	9.86	12.16	15.22	2.1	2.3
Yield (Kg./hd)	42.36	54.10	58.83	2.5	.8
Production	.42	.66	.90	4.7	3.1
Net imports	.00	.00	.01	7.2	17.5
Consumption	.41	.66	.90	4.8	3.2
Per cap.(Kg.)	8.10	10.19	12.99	2.3	2.5

than area. Use of soybeans, primarily for meal and oil, is expected to continue to match expansion in crush capacity. Imports are projected to grow 15 percent a year, slightly faster than consumption.

Soybean meal production will increase sharply as more beans are produced and crushed. However, domestic crush will not come near satisfying feed-related protein demand, and so soybean meal imports are likely to continue to expand. By 2000, meal imports are expected to approach 1 million tons, with growth exceeding 4 percent annually.

Copra production is not expected to expand in the 1990's because investments to enhance coconut output will not have an impact for at least 5 years. This will continue to limit copra crush, resulting in a slight decline in coconut oil production (table J-4). With increasing domestic demand for food and industrial uses, as well as declining real prices in world markets, exports of coconut oil are likely to fall at a faster pace than in the 1980's.

Pork

Real prices of hogs and pork are expected to rise only slightly, slower than in the 1980's. Upward pressure on prices from rising demand is projected to be mostly offset by larger hog inventories and increased slaughter, particularly as lower tariffs reduce domestic feed prices in the late 1990's. Pork yields should continue a modest upward trend, resulting in about 3 percent annual average growth in pork production (table J-5). However, with rising incomes, growth in per capita demand is projected to outpace production.

The government controls pork trade and imports are now permitted only under license and restricted to very small quantities. It is likely that the government will continue to control pork trade, with only small imports anticipated in the 1990's. Imports are not projected to be sufficient to balance supply and demand, resulting in higher domestic prices.

Table J-6. Philippines: Results of high income scenario

	2000		
	Base	High	Change
	scenario	income	
	-----Million tons-----		Percent
Net imports			
Wheat	2.54	2.72	7.0
Rice	.38	.49	29.3
Corn	.55	.73	33.0
Cotton	.06	.07	14.3
Soybean meal	.91	.97	6.7
Net exports			
Coconut oil	.66	.63	-4.5

Impacts of Stronger Income Growth

Income is a significant determinant of Philippine agricultural consumption. Because the economy is being redirected through both trade reform and IMF-sponsored stabilization programs, growth prospects are particularly uncertain. These reforms could accelerate income growth faster than anticipated. The agricultural trade impacts of increasing annual income growth 1 percent from the base scenario are shown in table J-6.

Higher income growth leads to significantly larger imports of most commodities by 2000. Rice and corn imports increase the most, followed by cotton, wheat, and soybean meal. Projected exports of coconut oil fall because of higher domestic consumption. Pork demand rises but, with import controls in effect, consumption and imports remain constrained.

The most significant trade impacts of higher income growth are estimated in the rice and corn markets. Although gains in rice consumption in response to higher incomes are slowing, higher incomes still increase aggregate rice demand. Thus, the gap between supply and demand expands, and by 2000, imports are nearly 30 percent above the base scenario.

The largest impact on demand from faster income growth would appear to be in the feed-livestock sector. Added demand, combined with continued constraints on imports of animal products, would raise domestic prices and producer incentives for animal products. Higher animal product production boosts demand for corn, soybean meal, and other energy and protein feeds. Corn imports in 2000 are estimated 33 percent higher than in the base projections.

Impacts of Rice Policy Reform

Rice policy reform has not been proposed but, in view of the base and higher income results, the Philippines may be hard pressed to maintain self-sufficiency and avoid imports. Since the producer support price of rice is now below the world price, imports could be reduced or avoided by raising the

Table J-7. Philippines: Results of rice policy reform

	2000		
	Base	Rice	Change
	scenario	producer price reform	from base
	-----Million tons-----		Percent
Net imports			
Wheat	2.54	2.60	2.4
Rice	.38	-.07	-117.5
Corn	.55	.69	24.8
Soybeans	.33	.33	-.6
Production			
Rice	7.23	7.65	5.8
Corn	7.05	6.98	-1.0
Soybeans	.04	.04	5.3

domestic price closer to the world price. To analyze the potential trade impact of reform, the support price is gradually increased, reaching the border price in 1997 and equaling it thereafter. This leads to significantly higher support prices and open market producer prices, and about a 5 percent increase in consumer prices. In addition, investment in irrigation is likely to increase with higher gross returns to rice production.

Higher prices increase projected rice area and yields, boosting production 6 percent above the base scenario by 2000 (table J-7). With higher consumer prices, rice consumption falls slightly. Together, these shifts eliminate the need for rice imports and generate a small exportable surplus by 2000. In actuality, it is unlikely that the rice will be exported, instead it will probably be stockpiled or consumed, reducing consumer prices a little.

With higher domestic rice prices, wheat and other foods would be relatively less expensive and more likely to be consumed. Projected wheat imports are 2 percent higher than the base scenario in 2000. Corn imports also rise, primarily because corn area would likely shift into rice in response to higher rice prices. Soybean production would benefit from an increase in irrigated area, but the trade impact is estimated to be negligible. Impacts on the meat and coconut product markets are also likely to be negligible.

Impacts of Corn Price Policy Reform

The moderate pace of corn policy reform incorporated in the base scenario does not equalize world and domestic prices. As an alternative, the potential impact of full corn price reform can be analyzed. In this scenario, the corn import ban is lifted immediately, the ad valorem tariff on corn imports is reduced to zero by 1998, and producer support price is set equal to the import price.

Table J-8. Philippines: Results of corn policy reform

	2000		
	Base scenario	Corn producer price reform	Change from base
	---Million tons---		Percent
Net imports			
Wheat	2.54	2.70	6.2
Rice	.38	.32	-17.0
Corn	.55	1.04	88.0
Soybean meal	.91	.93	2.8
Net exports			
Coconut oil	.66	.66	-.2
Production			
Rice	7.23	7.29	.8
Corn	7.05	6.83	-3.2
Pork	.90	.91	1.6

With these reform assumptions, domestic corn prices would fall relative to the base scenario and reduce expected returns for corn relative to alternative crops. Corn area and yields would both decline, reducing corn production in 2000 about 3 percent compared with the base scenario (table J-8). Food use of corn expands only slightly, but feed use is estimated to be nearly 5 percent higher than the base. Projected corn imports rise sharply to about 1 million tons in 2000.

Table J-9. Philippines: Results of reduced irrigation expenditure

	2000		
	Base scenario	Reduced irrigation expenditure	Change
	-----Million tons-----		Percent
Net imports			
Rice	.38	.85	122.8
Corn	.55	.92	66.5
Soybeans	.33	.34	1.8
Production			
Rice	7.23	6.74	-6.8
Corn	7.05	6.68	-5.3
Soybeans	.04	.02	-42.1

Corn sector reform would also affect other commodity markets through competition for land and consumption. Since corn prices fall relative to rice, a shift of corn area would increase rice production. On the demand side, some substitution of cheaper corn for rice would reduce rice imports, while substitution effects lead to higher wheat consumption and imports. Lower corn feed prices would also boost production of pork and other animal products by 2000, increasing import demand for soybean meal.

Impacts of Slowed Irrigation Investment

The weak financial condition of the Philippines and increasing competition for scarce fiscal resources may slow irrigation investment. In the base scenario, the average rate of growth in irrigation investment is assumed to be 3.5 percent, consistent with past trends. In an alternate scenario, the impacts of slowing investment growth to 1 percent annually are evaluated.

Most affected would be rice, corn, and soybean sectors, where the primary impact is likely to be reduced area expansion and production (table J-9). Yield effects would be mixed. Corn and soybean yields would be less affected because they are not heavily irrigated. However, rice yields would fall because the impact of fewer irrigated hectares is stronger than any price-related incentives to increase productivity.

Smaller supplies of rice, corn, and soybeans would lead to higher consumer prices. Consumption declines in response to higher prices are not projected to be sufficient to avoid increased imports. Rice imports in 2000 would be more than double the base scenario and corn about two-thirds higher. The impact on soybean imports would be small because domestic production accounts for a relatively small share of total supply.

Table J-10. Philippines: Results of higher corn yields

	2000		
	Base scenario	Higher corn productivity	Change
	-----Million tons-----		Percent
Net imports			
Rice	.38	.59	55.5
Corn	.55	-.12	-121.7
Production			
Rice	7.23	7.05	-2.5
Corn	7.05	7.71	9.3

Impacts of Higher Corn Productivity

With improved input supplies and production practices, growth in corn yields could exceed the base scenario, even without the development of new technologies. In an alternate scenario, annual growth in corn yields is increased 1 percent from the base scenario. Higher corn yields lead to increased expected returns to corn production, shifting some land from rice to corn. The net effect is estimated to be 9 percent higher corn production and a 2-3 percent drop in rice output compared with the base scenario (table J-10).

The production effects are projected to boost rice imports 55 percent higher than the base scenario in 2000. However, the need for corn imports would be eliminated, and the results suggest that a small corn surplus could develop. Surplus corn could be exported, depending on domestic and world prices, or absorbed by the feed industry to ease pressure on domestic feed and meat prices.

Implications for U.S. Trade

During the 1990's, the Philippines' imports of grains, cotton, soybeans, and soybean meal are expected to be higher than in the 1980's, while meat trade remains constrained by government policy. Wheat imports will rise faster than in the 1980's, while rice imports rise gradually and corn feed imports accelerate, particularly towards the end of the decade. Imports of soybeans are likely to continue expanding at a fast pace. Soybean supplies may not be sufficient to supply all additional protein needs and, therefore, soybean meal imports will rise. Exports of coconut oil, a primary foreign exchange earner, are not likely to keep up with the growth during the 1980's. However, this trend may be reversed in the early 2000's when copra yields improve following planned investments in the sector.

What are prospects for increased U.S. sales to the Philippines? Wheat import demand is expected to grow faster than in the 1980's. The United States has traditionally supplied 60-100 percent of all wheat imported. However, in the past 2 years, the Philippines has diversified its suppliers under fierce competition, buying from India and Saudi Arabia, in addition to its more traditional suppliers—the United States, Canada, and Australia. Canada is aggressively promoting its wheat, reportedly selling higher grade, higher protein varieties at heavily discounted prices. The U.S. share of this expanding market

will depend on price, and Export Enhancement Program (EEP) bonuses may continue to be the key factor in determining U.S. sales.

Soybeans, soybean meal, and cotton are also likely candidates for increased U.S. exports to the Philippines. Meal may be the largest revenue generator. The Philippines purchases meal from the United States, China, and India. India and China supply cheaper, lower quality meal in small volumes favored by some Philippine importers. U.S. sales have been limited to high quality 48-percent protein meal. If the expected increase in feed demand requires high quality meal, U.S. meal can increase or at least hold market share.

In the absence of sustained, aggressive investment in infrastructure, and increased incentives for corn production, the Philippines could become a regular corn importer by the end of the decade—provided that trade policies permit corn imports to occur. The United States has not sold a significant amount of corn to the Philippines since 1987. Because Thailand's and China's corn surpluses are likely to diminish in the 1990's, U.S. corn may be able to capture a large share of this growing market.

Corn import needs will be larger than projected if incomes rise faster than expected, grain price policy is reformed, or irrigation investment is reduced. Market-oriented reform of corn price policy would likely generate a relatively large increase in corn imports. Exposure to world prices for corn, without accelerated yield growth, is likely to reduce the number of producers. Reducing future corn imports will hinge on faster adoption of yield-enhancing technology, including improved seeds, cultivation practices, and irrigation.

In the base scenario, rice imports are expected to remain constrained by trade restrictions and continued growth in domestic production. Faster income growth or reduced investment in irrigation will increase the need for rice imports. However, significant increases in imports would likely push up world prices, so it is unlikely that rice imports of more than 500,000 tons will actually occur. Instead, if infrastructure investment is insufficient to maintain growth in rice output, the government may raise domestic producer incentives to reduce imports. Most of the rice imported by the Philippines is likely to be from sources other than the United States. Thailand, Vietnam, and other Asian countries have a transportation and varietal advantage.

South Korea

Ruth Elleson and John Dyck

Abstract: South Korea, the third largest farm market in Asia, is expected to resume strong economic growth in the 1990's. Demand for livestock products is projected to boost imports of feedstuffs and, particularly after nontariff barriers are removed in 1997, beef. Imports of value-added products are expected to grow, while cotton imports fall.

Keywords: South Korea, agriculture, policy, structural change, dietary change, trade, wheat, rice, corn, oilseeds and products, animal products, cotton.

Introduction

South Korea is an important and growing market for agricultural goods. It is the world's sixth-largest net import market for agricultural products and the fourth-largest export destination for U.S. agricultural goods. Major imports include cattle hides, cotton, wheat, corn, soybeans, and beef. The United States remains the leading supplier, but has lost a share of the grain market to China and the EC.

Korean GNP in 1991 reached \$271 billion, of which agriculture contributed \$24.5 billion, or 9 percent. In the 1950's, agriculture was the leading economic sector, but its importance in the Korean economy steadily declined after the manufacturing sector began its dramatic expansion in the 1960's. At a political level, however, agriculture remains important. The food industry remains a large sector of the economy, with 1990 expenditures on food, beverages, and tobacco accounting for almost 36 percent of final household consumption.

Korea's consumption patterns are changing fast, with a strong tendency toward diversification of food and beverage purchases. Although Korea still has many food trade barriers, its imports are also becoming increasingly diverse. The total value of agricultural imports is growing, and there is a potential for much future growth. The changing geopolitical situation in Northeast Asia has led to a widened range of sources for South Korea's agricultural imports—China was added in the last decade—and the range will increase still more if trade with North Korea develops.

Economic Trends and Policies

South Korea's record of strong economic growth since the mid-1960's is widely known. Although political changes have occurred, the government has followed a growth strategy focused on exports of manufactured goods. Because South Korea is not rich in natural resources, the strategy involved importing and processing raw materials for export. Raw materials for the most part could be freely imported for such processing. With government support, large industrial conglomerates arose that coordinated processing and trade of commodities.

Profound Changes in the 1980's Affect the Economy

Until the 1980's, the whole country was expected to invest in the future by limiting wage demands and foregoing consumption of many imported goods, which were often barred by import controls. The political system was authoritarian in the 1960's and 1970's and helped curb growth in wages and consumption.

The 1980's were turbulent for South Korea, politically and economically. The end of the cold war had important impacts on Korea's economic and political systems at the same time that internal pressure for greater democracy and higher wages strengthened. Wages rose significantly in real terms and relative to competing economies. Political leadership and policy changes became more frequent and less predictable. The movement of people, capital, and goods in and out of Korea became much freer.

Despite the important changes of the 1980's, South Korea's economy grew strongly for most of the decade. Wage increases did not cripple growth because higher productivity resulted from investment in automation. In addition, new sectors such as the automotive and computer industries emerged, more than offsetting the slower growth in the textile and shoe industries as they became less competitive.

Economic Prospects

Economic prospects for the 1990's and beyond are uncertain. South Korea has given up much of its autonomy from the world economy and external shocks and trends are felt more quickly and deeply. Koreans still aim for quicker growth than other developed economies. Given Korea's well-educated population, experience in trading, and reasonably good economic infrastructure, most observers assume its growth will continue to be strong.

Factors that could negatively affect economic growth include a wide array of institutional arrangements that may make South Korea less competitive in international markets. For example, the conglomerates may be too inflexible to compete in a rapidly changing world, the financial sector is protected from international markets, and special interest groups are

able to influence the political process. In addition, wage growth is forcing the country to compete in higher technology sectors and the capacity for research, development, and investment may not be sufficient to compete with Japan, North America, Taiwan, and Western Europe.

Positive factors include the country's vastly increased knowledge of the rest of the world, acquired in the 1980's. This steadily increasing knowledge base, combined with Korea's already potent trading abilities, could make the country more successful. Korea has partly opened its economy, allowing quicker, more flexible responses to trading opportunities and greater competitiveness, because international firms are competing in the Korean economy, forcing Korean firms to fight for market share on their home ground. Liberalization also has led to lower consumer prices for some goods. The quick wage increases of the 1980's were, in part, the response to pent-up frustration among workers over decades of privation. The 1990's are less likely to see sharp upward wage movements.

Relations with North Korea and the Former Soviet Bloc

A major question about the Korean economy's growth in the 1990's involves the fate of North Korea. If South Korea is forced to stabilize, underwrite, or incorporate the economy of the North in the aftermath of political changes there, the cost could be high, and the growth rate could fall. On the other hand, if industries in the South successfully trade with the North and employ the North's low-cost human and natural resources, the net effect on South Korea's economy could be positive.

South Korea began a major diplomatic and commercial initiative in the early 1980's to diversify trade in goods and services, partly by targeting countries of the former Soviet bloc. The strategy seems to be paying off, with Korean firms in the forefront of commercial transactions in eastern Russia, Eastern Europe, and the non-Russian republics of the former U.S.S.R. Commercial links with China began well before the normalization of diplomatic relations in 1992, and now are accelerating. Positive returns from the ventures in the formerly centrally planned countries are expected to boost Korean firms and the economy, but there are elements of risk as well.

Agricultural Trends and Policies

Korea's farm sector is characterized by small-scale, high-cost family operations. The country's 1.8 million farms averaged 1.2 hectares in size in 1990. Farm size is relatively uniform: 33.5 percent of all farms are between 0.5 and 1 hectare, 28.8 percent are smaller than 0.5 hectare, and 37.7 percent between 1 and 3 hectares.

The small size and uniform distribution of farms reflect the effects of a thorough land reform carried out by the government after the Korean War. Although the land reform legislation, which mandates a 3-hectare maximum farm size, is a barrier to increasing area per farm, other factors also are important. These factors include the reluctance of farm fami-

lies to sell land, as well as the country's hilly terrain, which limits the area suitable for large-scale mechanized farming.

Agricultural Background

Rice and other grains, soybeans, and fish dominated Korean agriculture and food for hundreds of years. As a kingdom linked to the Chinese empire, as a colony of Japan (1910-45), and in much of the Cold War era, Korea was a relatively poor, isolated country that could not import food freely. With a very dense population, the country was forced to depend on intensive production of rice, barley, wheat, and other crops to feed itself, and the diet was heavily grain-based and often barely sufficient in calories.

In contrast to other East Asian countries, Korean farm households are more dependent on farm income than on off-farm income. This is largely the result of the concentration of nonagricultural jobs in only two or three urban areas. Nevertheless, as agriculture's role in the economy and labor force declined, rural non-farm income climbed from 20 percent of farm household income in the early 1960's to 44 percent in 1991. This can be compared to nonfarm income of over 80 percent in Japan and approximately 70 percent in Taiwan.

Farm income in Korea depends upon government policies, such as high price supports, government purchases, and import restrictions. Farm prices for many commodities are supported above world prices, and often do not reflect changes in world prices.

Structural Changes in a Rice-Based Agriculture

Rice farming has remained central to Korea's agriculture and, as other parts of crop agriculture withered, has become even more important over time, accounting for 39 percent of total agricultural output value in 1990. Rice farming has changed relatively little in some key ways. Farms are small and often paddies on a farm are not contiguous. Labor requirements, while less than in the past, are still far higher than in other parts of the world. The market for rice land remains special, with families reluctant to sell or rearrange their holdings.

However, although on the surface not much has changed, the infrastructure to support small-scale rice farms has eroded. Steady, high outmigration from rural areas has depleted the labor force needed for individual cultivation of the farms. The household income of remaining farmers has been maintained only because of the government's enormous subsidy to farmers through its high-price regime.

The socio-economic gulf between urban and rural areas has remained wide, with educational and medical services, roads, and communication in rural areas decidedly inferior to those in the cities. South Korea's economy has provided relatively fewer nonfarm job opportunities in rural areas than Japan or Taiwan. The remaining farmers are aging and many want to quit farming. The one-hectare rice farming operation is becoming unsustainable and will soon fade out.

Rice Supply and Demand

Korea is self-sufficient in rice, and imports are banned to protect domestic growers. Only minor amounts have been allowed entry for processing and re-export. South Korea's rice is of the japonica type, and the country has achieved some of the highest yields and best quality in the world.

Rice consumption per person has declined—from a high of 135.6 kilograms per year in 1979 to 116.3 in 1991. Until the mid-1980's, South Korea had great difficulty in maintaining rice self-sufficiency. One method used to increase production was to encourage higher-yielding rices developed from crossing indica and japonica varieties. However, consumers would not buy such rice except at a large discount. In the late 1980's, the government built up significant surplus stocks of the high-yielding rice. Government purchases of the high-yield varieties ended in 1991, and they are no longer grown. This means that the average yields of Korean rice harvests will be lower than in the past. Because of the decline in consumption per person, future demand for rice now appears to be comfortably covered by the existing high stocks and somewhat smaller crops.

Other Grains Increasingly Imported, Not Produced Domestically

As the country became increasingly able to import foodgrains and as labor costs rose, South Korean agriculture abandoned the production of many other crops: wheat, millet, sorghum, cotton, etc. Double-cropping of winter grains on rice paddies has declined steadily over the last 20 years. Field crops besides rice had a 10 percent share of agricultural production value in 1990, and the share is slowly declining. Such crops include, in order of value, barley, sesame, tobacco, soybeans, ginseng, perilla, peanuts, red beans, corn, and a number of minor crops. Barley, soybean, and corn production is kept going almost solely by government subsidies and trade policies.

Barley consumption declined in the postwar period as incomes rose and consumers turned to rice. The government propped up barley consumption until the early 1980's by requiring that it be mixed with rice. The end of this requirement led to a precipitous decline in food consumption of barley, now only 1 kilogram per person per year. The government continues to ban barley imports for feed use. Imports of malting barley and barley malt became important in the 1980's.

Corn is widely used in both the food processing and feed sectors. Overall feed use of grains continues to rise. Domestic livestock production is highly dependent on imported feed ingredients. About three-quarters of all feed ingredients—coarse grains and soybeans—must be imported. Use of corn in the feed sector is highly dependent upon price competition with other imported feed ingredients, especially feed wheat and, to a minor extent, cassava pellets. Most corn imports now come from China. The exception is U.S. corn purchased with GSM guaranteed loans, most of which is destined for the processing sector.

Demand for products of the dry milling industry—corn grits, meal, and flour—has remained relatively stable since 1988. But corn use in the wet milling industry—starch, corn syrup, etc.—continues to expand rapidly. This trend is expected to continue as consumer incomes grow and demand for sweetened products, including bakery goods and beverages, increases.

Wheat imports are dominated by a few companies, although the wheat import system was liberalized in January 1990, allowing any trader or offer agent to import and then sell wheat directly to millers without government approval. Imports are divided between a relatively stable, quality-conscious milling-wheat market supplied primarily by the United States, and a very volatile and price-sensitive feed wheat market. The milling-wheat market remained level in the 1980's as increased demand for flour used in noodle preparation offset a decline in demand for use in alcoholic beverages. Wheat consumption for food use has remained between 30 and 32 kilograms per person per year, with peak levels reached in the early 1980's.

Soybean Imports Dominate Oilseed Complex, But Challenges Loom

Imports account for about 96 percent of soybean consumption in Korea. Soybean demand is increasing in both the feed and food sector. Domestic soybean production is dependent on government support through import quotas and direct purchases. Roughly two-thirds of domestic and imported soybeans are crushed, with the remainder processed into foods such as bean curd and soy milk or eaten whole. The volume of Korean soybean crushing is limited by domestic demand for cooking oil. Since domestic demand for soybean meal significantly exceeds the amount supplied by domestic crush, meal imports, often soybean meal or rapeseed meal from China, fill the gap.

All soybean crushing in Korea is done by three large crushers. In January 1991, both soybean oil and meal became freely importable. However, a sharp increase in soybean oil imports led to a temporary (renewable) tariff increase to protect local crushers and allow their soy oil to compete better with imported oil. Domestic soybean consumption is again expected to continue to follow demand for cooking oils. Further liberalization of the oilseed markets is still a government goal, and would likely lead to reduced soybean imports, replaced by imports of meals, oils, and rapeseed.

A Growing, Rapidly Changing Livestock Sector

In 1990, livestock production accounted for 23.5 percent of agricultural production value. Livestock production has grown strongly during the last decade, with the total volume of meat, eggs, and milk output more than doubling. In value terms, however, there has been less growth because the two biggest activities, beef cattle and swine raising, have shown no sustained growth in value. For beef cattle, this is because of extreme cyclical behavior that drove many producers out of business, and because the resumption of beef import quotas in 1988 introduced competition that constrained cattle prices, although prices continued to rise through 1991. Beef produc-

tion in 1990 was little more than in 1980, and prospects for strong expansion are poor.

Pork production, unlike beef, doubled over the decade. Boom and bust cycles led to concentration of production among lower-cost producers. The drop in producer prices meant that total value of production did not grow in nominal terms after 1982, despite considerable output growth.

Broiler and egg output value grew in real terms, but by far the strongest growth was in milk production, which grew by over 350 percent in volume and over 400 percent in value during 1982-92. The poultry and dairy sectors remain well insulated from foreign competition by trade and transportation barriers.

With the exception of beef, hides, and animal fats, Korea is nearly self-sufficient in livestock products due to a highly protective import regime. However, that regime is being challenged internally by high demand and retail prices and externally by pressure to liberalize trade. The first meat commodity to be opened to some trade was beef, the favorite meat of Koreans. Largely because of internal price pressure, Korea's beef import quotas resumed in 1988 after a 6-year absence. After an unfavorable GATT ruling in 1989, Korea committed itself to minimum import quotas for 1990-96, and an end to nontariff barriers in 1997. By 1991, the country imported 53 percent of its beef supply under strict government control.

Pork consumption has grown rapidly from a small base. Pork became the leading meat because beef was in short supply and quite expensive relative to pork. South Koreans have adopted a number of processed pork products into their diet, but fast-food outlets for pork dishes are uncommon. As time constraints become more important for urban residents, the fast food outlets are becoming areas of most rapid growth for meats, except for pork. Pork consumption is also being buffeted by the increasing availability of relatively cheap imported beef.

The introduction of fast-food, fried-chicken franchises brought about a rapid expansion in broiler consumption, and more growth is expected. Eggs have long been used in Korean cooking, and consumption grew by over 25 percent in the 1980's. The poultry industries have not seen the same wild swings in producer prices as the swine sector, but nevertheless have experienced a steady growth in size of operation as the cost advantages of larger operations have aided their competitiveness.

Domestic Production Still Supplies Most Fruits and Vegetables

Vegetable and fruit production grew strongly in value in the 1980's, and accounted for about 25 percent of total agricultural value in 1990. Although a wide variety of vegetables are produced, production is dominated by two crops—garlic and red pepper—which contribute over half of the total value of vegetable output. Fruit crops, in order of value, are apples, watermelons, oranges, peaches, pears, grapes, and persim-

mons. Trade and phytosanitary barriers have afforded the sector almost complete protection from foreign competition.

High-Value Products Take a Growing Share of Expenditures

Korea's rapid economic growth has changed the pattern of food demand. The dramatic rise in per-capita GNP from \$285 in 1971 to \$6,498 in 1991 resulted in increasing consumption of western-style foods. The demand for rice and barley declined, while products such as beef, fresh fruits, and vegetables continue to provide a greater portion of the Korean diet. Many processed foods have become very popular, and consumer-ready products offer the greatest potential for growth in consumption and trade. Imports of processed foods grew dramatically in 1991, reaching about 17 percent of total agricultural imports.

As Korean consumers become more affluent, products such as fresh and processed fruits and vegetables, meats, and confectionary goods will continue to provide a greater portion of the diet. The United States and other exporters of high-value products still encounter a number of tariff and non-tariff barriers. Many of these are related to a government desire to check overall consumption growth, especially for so-called luxury items. On the other hand, land, labor, and capital shortages remain significant problems for the expansion of domestic production.

Industrial Raw Materials

Domestic production of hides, skins, and cotton is extremely limited. Imports are relatively unrestricted since they serve as inputs for export industries. Currently, these industries suffer from high wage costs and increasing competition from less-developed Asian countries. A decline in these industries and imports of raw materials for them is occurring, one which is likely to continue over the long term.

Agricultural Policy and Policy Changes

The two major goals of Korean agricultural policy have been a high degree of self-sufficiency and parity between farm and urban household incomes. The government has pursued these goals through the use of strong producer-price incentives and the simultaneous ban of imports. The resulting high consumer prices transfer income from urban consumers to farmers and inhibit overall consumption. For rice and barley, the government also affects prices and producer income by purchasing a significant share of total output, at a high cost to the budget and taxpayers. These policies have led to generally high yields, but have also resulted in production costs far above international prices.

In late 1991, the government announced a 10-year, 4.17 trillion Won (US\$ 55 billion) rural development plan to restructure the agricultural sector to increase efficiency and rural income. This is important in view of the changes that are currently taking place in agricultural labor. By the end of the decade, trends indicate that the number of farmers will drop to 2 million from 3.28 million in 1990, and only about 1 percent will be under age 30.

The program, if fully funded, could ease the transition that the agricultural sector will go through during the next decade. One important part of the plan, which has not yet been approved, would increase the limit on land holdings by individual farmers from 3 hectares to 20 hectares. In addition, the government plans to designate 1 million hectares of paddy land (83 percent of the total) and another 100,000 hectares of dry fields for investment aid and tax exemptions. In the early stages of the program, considerable effort will be made to improve the mechanization of rice farms. Another aspect of government planning is to recognize the role that a market for contract services in rice production can play. The government is encouraging the development of such a market with administrative guidance and selective machinery subsidies.

Besides rice, the new policy will concentrate on 13 agricultural products that are potentially competitive after market liberalization. These products include apples, pears, tangerines, persimmons, kiwifruit, mushrooms, a type of local prune, fresh vegetables, medicinal herbs, flowers, poultry, swine, and silk worms.

Issues Affecting Agricultural Trade in the 1990's

The current decade is likely to see major changes in South Korean agricultural trade. Procurement of agricultural supplies would shift away from domestic sources toward imports if South Korea makes trade policy changes. Uncertainty about relations with North Korea affects South Korea's agricultural markets. In comparison to these issues, demand changes will be less dramatic. However, income growth is expected to spur further changes in the diet that will increase trade.

Agricultural Policy Pressures

Two main issues confront South Korea's agriculture in the 1990's. Domestically, agriculture is uncompetitive with the rest of the economy. Farm household income, which slipped well behind urban incomes in the 1960's, was brought close during 1975-90, through huge subsidies from taxpayers and consumers. It will be extremely difficult to maintain rural incomes near urban levels as long as the present structure of agriculture persists. Within Korea, consumers and policymakers increasingly recognize the constraints that high prices put on consumption and the costs imposed on the economy.

The second problem is the degree to which South Korea has become uncompetitive with agriculture elsewhere. The trade barriers used to prevent international competition are under pressure from agricultural exporting countries. Existing and proposed GATT frameworks are at odds with Korea's trade protection for agriculture.

It appears that the 1990's will see major changes that make Korean agriculture somewhat more competitive, but the sector may shrink in the process. Among the trade issues, South Korea's ban on the beef trade was successfully challenged in the GATT by exporting countries in 1989. Simultaneously,

South Korea abandoned its balance-of-payments justification (in the GATT framework) for a number of trade restrictions. While this led to Korean liberalization of some commodities, new restrictions were imposed on others, and import protection for rice and a number of other crops continues to be a high priority. A settlement of the Uruguay Round trade talks would, however, induce Korea to liberalize even these markets. Market liberalization would lead to a greater share of imports in almost all the commodity markets and sometimes to lower production by Korean producers.

The lack of domestic competitiveness, still dealt with by ever-increasing subsidies—either directly from the government or indirectly from consumers—may be resolved through a massive structural adjustment in the 1990's and thereafter. The farmer population is now stretched too thinly over the 1.7 million farms, and consolidation in one form or another is the only alternative to abandoning farmland. The government understands this, and wishes to hasten and facilitate farm consolidation. This will reduce the number of farmers, and perhaps the value of overall production, but the volume of production and Korean agriculture's market share in the face of liberalization could be greater with structural adjustment than without it. Farm consolidation and structural adjustment have considerable potential to reduce production costs and producer prices.

Market liberalization would change all of Korea's food markets, and could occur even if there is no GATT agreement. Since 1989, Korea has announced plans to liberalize trade in many foods. Among the major examples, fresh and chilled poultry imports were to become freely importable in January 1993, and fresh/chilled pork one year later. Barriers to frozen poultry and pork and for all parts of the beef market must conform to existing GATT rules by 1997. After that, only a 25 percent tariff, the foot-and-mouth disease restriction, and other sanitary barriers will protect Korean meat producers. Processed pork imports were liberalized in 1990, only to be granted temporary, higher levels of protection a year later. Also, the government has stated that rice and some other domestically-produced crops will not be liberalized.

Income and Population Growth

Korea's population growth has slowed to under 1 percent, and is likely to slow still further. Income growth is less certain. The high growth of the past three decades makes it natural to expect South Korea's growth rates to be high by world standards in the future. But the increasingly open and liberalized political and economic systems may mean less certainty and stability in economic policy. Furthermore, Korea has advanced to the level of some of the OECD countries in terms of income and wages. It has thus changed the nature of its foreign competition, and will have to rely on new skills and industries and on its own capital in order to compete successfully. While South Korea still has advantages that enable it to achieve high growth, there is more uncertainty than in the past that the growth rate will exceed those for developed countries. The base scenario assumes that annual real GDP growth will average 7.3 percent during 1992-2000.

Uncertainty About North Korea

The reunification of Germany in 1990 demonstrated how profound geopolitical changes could occur in a short period of time. North Korea now stands more isolated than ever in the world, and apparently faces economic stagnation, at best. Its aging leadership may be replaced during the 1990's. There are many possible scenarios for North-South Korean interaction in the coming decade. Of these, the least likely is that the two economies will return to the complete separation that typified the period 1953-1989. There will at least be some commodity trade, some investment by South Koreans in light industry in the North (especially in fabricating textile and leather goods), and some economic aid or donations by the South to the North. Much more interaction could develop quickly, and the range of possibilities includes speedy reunification if there is a political collapse in the North similar to East Germany's.

The interactions of the two economies have implications for agriculture in the South. One of the most important is that the North is deficit in rice and the South is now in surplus because of declining consumption and heavily subsidized production. There have been proposals to send rice from the South to the North, and two small shipments have occurred. Another important factor is that wages in the North are much lower than in the South. A shift of the textile and leather industries from the South has been discussed and in minor ways is already occurring. This would bolster prospects for cotton and hide imports into Korea, although not necessarily into South Korea. Finally, there is apprehension among economists that aid to or absorption of the North by the South could seriously impair South Korea's growth prospects in the 1990's.

Agricultural and Trade Prospects to 2000

The first scenario assumes no change in policies as of 1992, despite the announced intent to end the trade barriers formerly justified by balance of payments factors. A second scenario includes the effects of the removal of quotas and other non-tariff barriers on beef in 1997 agreed to by Korea in 1989. The first scenario also assumes future growth of incomes as described above, and a continued real decline in world commodity prices (see Box 3). Relatively strong income growth assumes a rebound from the current economic problems, with growth spurts in 1994 and 1997. Population growth is fixed at .95 percent per year. No large-scale integration of the South and North Korean economies is assumed.

Livestock Product Demand

Demand for meats, eggs, and milk is determined by the use of income, own-price, and cross-price elasticities that are applied to the income and price changes. The elasticities are estimates from other studies. Those for meats are reduced at a steady rate over the projection period, because meat consumption growth in Korea may slow as the amount rises.

Livestock product demand is met by a mixture of domestic supply and imports determined exogenously by assumptions about self-sufficiency in each product in each year. The first

Table K-1. South Korea: Projections for meats

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates -----	
				1980-90	1992-00
	-----Million tons-----			---Percent---	
Beef					
Slaughter	.50	.56	.69	1.1	2.2
Yield	.23	.23	.28	.4	1.7
Production	.11	.13	.19	1.4	3.9
Net imports	.03	.12	.51	14.5	15.2
Consumption	.15	.25	.70	5.5	10.8
Per cap.(Kg)	3.8	5.8	14.8	4.3	9.8
Ending stocks	.01	.02	.05	8.0	11.0
Pork					
Production	.22	.59	.99	10.3	5.2
Net exports	.00	.00	.00	**	**
Consumption	.23	.62	.98	10.6	4.7
Per cap.(Kg)	5.9	14.5	20.8	9.3	3.7
Ending stocks	.00	.00	.00	-18.8	-100.0
Poultry					
Production	.11	.22	.48	6.8	8.1
Net imports	.00	.01	.03	**	18.5
Consumption	.11	.22	.51	6.9	8.7
Per cap.(Kg)	3.0	5.2	10.8	5.7	7.6
Ending stocks	.00	.00	.07	.0	**

** = incalculable value

Figure K-1

South Korea: Beef Consumption and Imports

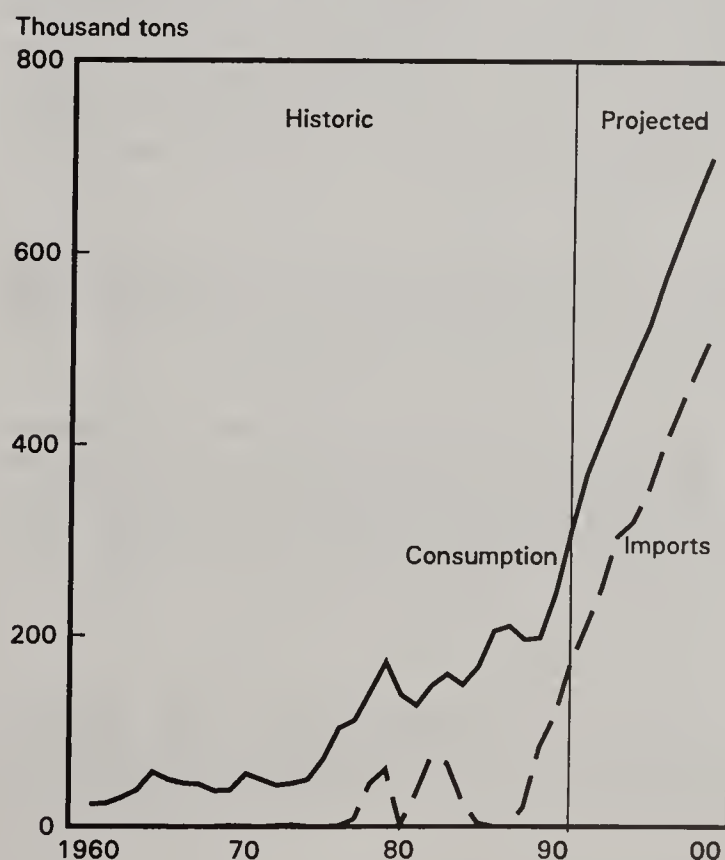


Table K-2. South Korea: Base projections for milk and eggs

			Growth rates		
	1979-1981 avg.	1989-1991 avg.	2000	1980-90	1992-00
	-----Million tons-----		---Percent---		
Milk					
Cows	.10	.30	.39	11.6	2.5
Yield	4.42	6.07	7.65	3.2	2.3
Production	.45	1.85	2.98	15.2	4.9
Net imports	.00	.00	.00	.0	.0
Consumption	.45	1.84	2.98	15.2	4.9
Per cap.(Kg)	11.8	43.0	63.2	13.8	3.9
Ending stocks	.03	.07	.11	8.1	4.4
Eggs					
Production	.26	.44	.63	5.6	3.6
Net imports	.00	.00	.00	**	-6.7
Consumption	.26	.44	.64	5.6	3.7
Per cap.(Kg)	6.8	10.5	13.5	4.5	2.5
Ending stocks	.00	.00	.00	**	4.1

** = incalculable value

scenario assumes high self-sufficiency in most livestock products. For beef, the scenario assumes continued quotas through 2000 instead of the end of the quota system in 1997. These are conservative assumptions, made in order to assess the effects of expected policy changes.

Under assumptions of no policy change, pork consumption per person grows by 30 percent, broiler consumption by 38 percent, and beef consumption by 75 percent, 1992-2000 (table K-1; figure K-1). Overall meat consumption grows by 43 percent, a growth rate of 4.6 percent per year, on average. This is below the increase of real GDP per person, and below the growth of meat consumption in the last 3 years, but still high by world standards.

Milk demand is projected to grow slower than in the past, but still at over 3 percent per person per year. Egg consumption, which grew during the 1980's, is now high by world standards and is projected up only slightly (table K-2).

The caloric increase implied by greater livestock consumption is balanced in part by a reduction in calories from foodgrains. Fat and protein intake rise. Because the Korean diet is quite low in fat and animal protein compared to developed country diets, this rise is plausible, given increasing incomes and urbanization.

Livestock Supply

Projections of herd sizes and composition for the native (han-woo) cattle, dairy beef, and dairy cow (Holstein) populations

Table K-3. South Korea: Base projections for crops

			Growth rates		
	1979-1981 avg.	1989-1991 avg.	2000	1980-90	1992-00
	-----Million tons-----		---Percent---		
Wheat					
Area	.02	.00	.00	-100.0	.0
Yield (Mil. ha)	3.13	3.00	.00	-.4	-100.0
Production	.06	.00	.00	-34.0	-100.0
Net Imports	1.92	3.77	3.76	7.0	.0
Consumption	1.98	3.36	3.75	5.5	1.1
Food	1.97	1.94	2.04	-.2	.5
Per cap. (Kg)	51.6	43.1	43.3	-1.8	.0
Feed	.01	1.42	1.71	70.1	1.9
Ending stocks	.20	.30	.20	4.1	-3.9
Rice					
Area	1.23	1.24	1.19	.1	-.4
Yield (Mil. ha)	3.85	4.55	4.51	1.7	-.1
Production	4.73	5.63	5.36	1.8	-.5
Net imports	1.03	-.01	-.01	-46.4	.0
Consumption	5.54	5.48	5.36	-.1	-.2
Food	5.54	5.48	5.36	-.1	-.2
Per cap. (Kg)	145.3	127.9	113.8	-1.3	-1.2
Feed	.00	.00	.00	.0	.0
Ending stocks	1.20	2.07	1.19	5.6	-5.4
Coarse grains					
Area	.39	.18	.13	-7.4	-3.1
Yield (Mil. ha)	2.65	3.88	3.55	3.9	-.9
Production	1.03	.70	.47	-3.8	-3.9
Net imports	2.63	6.16	9.82	8.9	4.8
Consumption	4.11	6.95	10.27	5.4	4.0
Food	1.81	2.22	2.76	2.1	2.2
Per cap. (Kg)	47	52	58.49	.9	1.2
Feed	2.30	4.73	7.52	7.5	4.7
Ending stocks	.61	.32	.69	-6.3	8.0
Cotton					
Production	.00	.00	.00	.0	.0
Net imports	.34	.43	.38	2.5	-1.3
Consumption	.33	.43	.38	2.7	-1.4
Ending stocks	.13	.12	.09	-1.0	-2.2

begin with the herd structure of 1992. The milking herd grows because milk demand is expected to continue rising. The native cattle herd grows slowly. Carcass weights for both types of beef continue to increase. Domestic beef production rises by one-third, 1992-2000. Pork and poultry production grow at the same rate as demand.

Feed Grain-Oilseed-Vegetable Oil Complex

Given livestock production, fixed feed-conversion factors are used to estimate grain and oilseed meal requirements (tables K-3 to K-5; figures K-2 and K-3). The conversion factors differ for each livestock type, and are based on recent estimated ratios. Data deficiencies make these ratios uncertain, however. Vegetable oil demand is determined with elasticity estimates (table K-6). Oilseed balances assume that crush will continue until domestic oil demand is filled, and that imports will fill meal needs greater than the domestic crush.

Table K-4. South Korea: Base projections for oilseeds

	1979-1981 avg.	1989-1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
-----Million tons----- ---Percent---					
Total seeds					
Area (Mil. ha)	.22	.16	.15	-3.5	-.5
Yield (Kg/ha)	1.26	1.62	1.64	2.5	.2
Production	.28	.25	.24	-1.1	-.4
Net imports	.53	1.15	1.55	8.1	3.0
Consumption	.82	1.33	1.79	5.0	3.0
Food	.37	.41	.50	1.0	1.9
Per cap.(Kg)	9.8	9.7	10.6	-.2	1.0
Feed/seed/wst	.02	.01	.01	-8.1	.0
Crush	.43	.91	1.28	7.7	3.5
Ending stocks	.06	.18	.09	11.8	-7.0
Rapeseed					
Area (Mil. ha)	.01	.00	.00	-11.7	-100.0
Yield (Kg/ha)	2.05	1.73	NA	-1.7	-100.0
Production	.03	.01	.00	-13.2	-100.0
Net imports	.03	.00	.00	-100.0	.0
Consumption	.05	.01	.00	-19.0	-100.0
Food	.00	.00	.00	.0	.0
Per cap.(Kg)	.0	.0	.0	.0	.0
Feed/seed/wst	.00	.00	.00	-4.0	-100.0
Crush	.05	.01	.00	-19.8	-100.0
Ending stocks	.00	.00	.00	-100.0	.0
Soybeans					
Area (Mil. ha)	.20	.14	.14	-3.3	-.4
Yield (Kg/ha)	1.22	1.56	1.56	2.5	.0
Production	.24	.22	.21	-.9	-.4
Net imports	.50	1.06	1.43	7.8	3.1
Consumption	.76	1.21	1.65	4.8	3.1
Food	.36	.36	.42	.0	1.6
Per cap.(Kg)	9.5	8.4	8.9	-1.2	.6
Feed/seed/wst	.02	.01	.01	-7.7	.0
Crush	.37	.84	1.22	8.5	3.8
Ending stocks	.05	.17	.08	12.6	-7.3

Figure K-2

South Korea: Coarse Grain Consumption and Feed

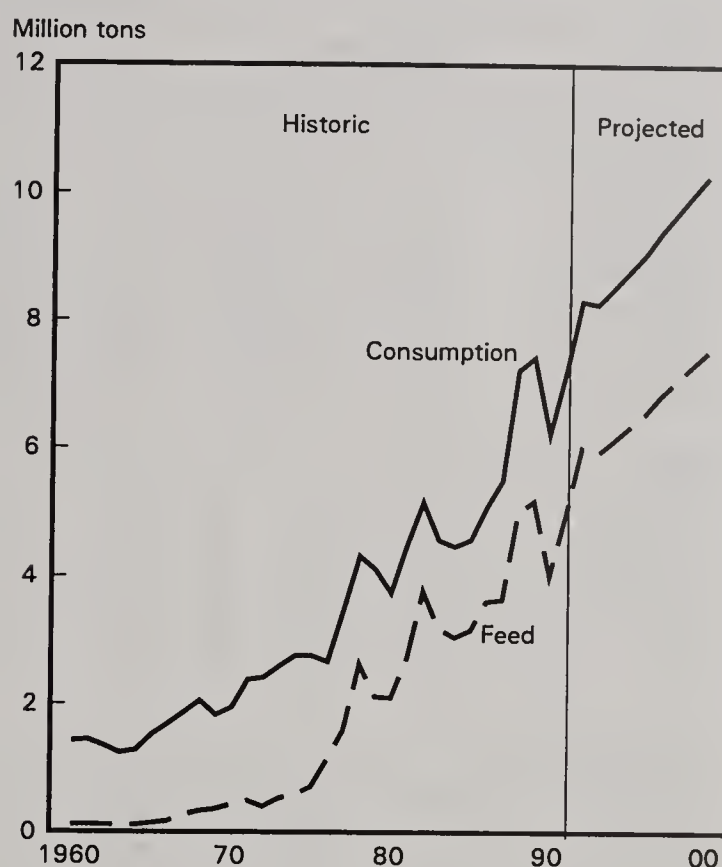


Figure K-3

South Korea: Oilseed Consumption

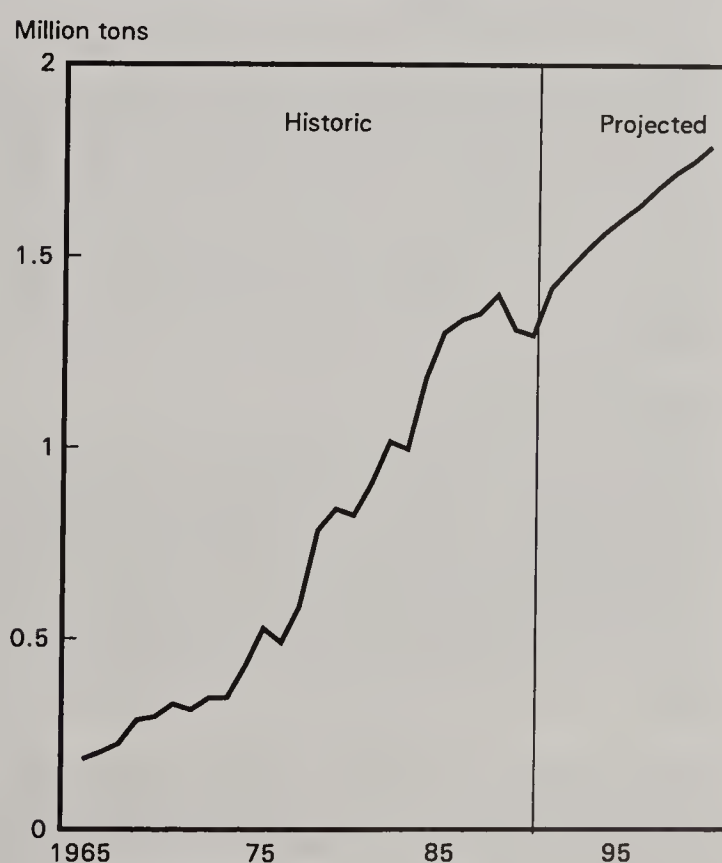


Table K-5. South Korea: Base projections for meals

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
	-----Million tons-----			---Percent---	
Total meals 1/					
Production	.33	.70	.98	7.9	3.4
Net imports	.05	1.15	1.88	34.4	5.1
Consumption	.40	1.81	2.96	16.5	5.0
Nonfeed	.00	.04	.05	**	1.5
Feed	.40	1.77	2.91	16.2	5.1
Ending stocks	.07	.27	.41	14.2	4.6
Soymeal					
Production	.30	.67	.97	8.4	3.7
Net imports	.04	.49	.85	24.8	5.6
Consumption	.36	1.13	1.84	12.2	5.0
Nonfeed	.00	.03	.03	**	.0
Feed	.36	1.10	1.81	11.9	5.1
Ending stocks	.07	.20	.30	11.3	4.3
Rapeseed meal 1/					
Production	.02	.01	.01	-13.1	.0
Net imports	.01	.34	.57	50.0	5.4
Consumption	.03	.41	.57	28.0	3.3
Nonfeed	.00	.02	.02	**	.0
Feed	.03	.39	.55	27.3	3.5
Ending stocks	.00	.07	.12	38.4	5.3

1/ Soymeal equivalent.

** = incalculable value

The current tariff structure, which precludes rapeseed imports, is assumed to remain. This means that soybeans are the primary oilseed crushed. Imports of both soy and rapeseed meal increase as feed use of meals grows faster than vegetable oil use. Fish meal supply is assumed to remain at current levels. Domestic soybean production is held fixed at current levels. Food use of oilseeds is determined with elasticity estimates.

Other Grain Demand

Nonfeed uses of wheat and coarse grains are determined with elasticity estimates. Wheat for nonfeed use rises slightly on a per-person basis. Nonfeed use of corn is linked to estimates of sugar demand, and is projected to rise gradually. The projections assign a 19-percent share of feedgrain to feed wheat, below the average for recent years (figure K-4).

Rice

Rice consumption per person is projected to fall by almost 12 kilograms by 2000. Projections recently made in Korea show even greater drops in rice consumption. With the projected decrease in consumption and abandonment of the in-

Table K-6. South Korea: Base projections for oils

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
	-----Million tons-----			---Percent---	
Vegetable oils					
Production	.09	.19	.25	8.4	2.6
Net imports	.08	.28	.41	12.2	3.8
Consumption	.14	.47	.65	12.9	3.2
Food	.13	.38	.54	11.2	3.6
Per cap.(Kg)	3.4	8.8	11.4	9.9	2.6
Industrial	.01	.09	.11	26.2	1.5
Ending stocks	.01	.03	.05	8.7	5.4
Soy oil					
Production	.06	.15	.21	9.1	3.4
Net imports	.00	.01	.02	**	9.1
Consumption	.06	.17	.24	11.3	3.5
Food	.06	.17	.24	11.3	3.5
Per cap.(Kg)	1.50	3.89	4.99	10.0	2.5
Industrial	.00	.00	.00	.0	.0
Ending stocks	.01	.02	.04	8.9	7.2

** = incalculable value

Figure K-4

South Korea: Wheat Consumption and Feed

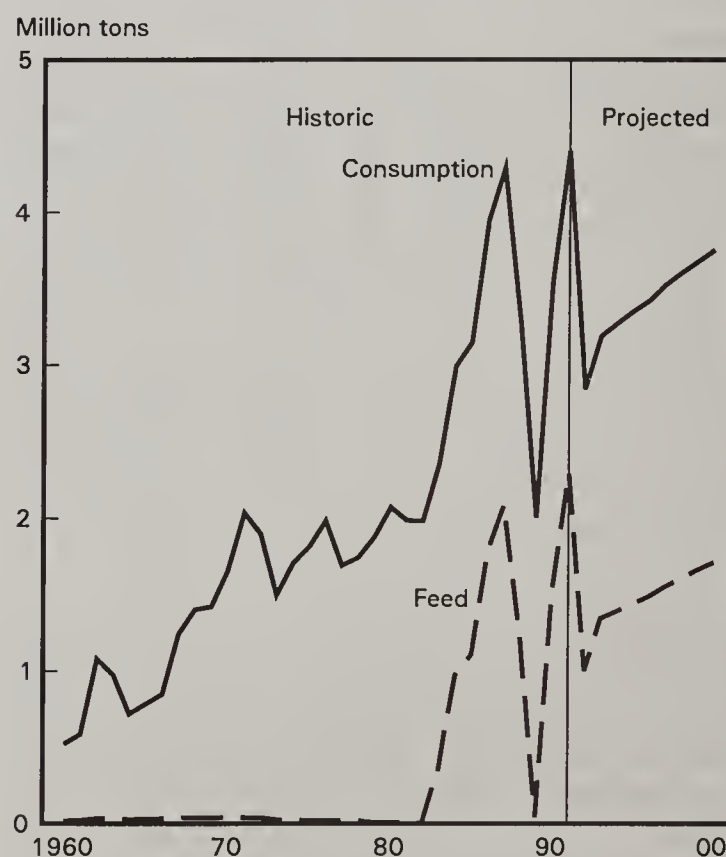


Figure K-5

South Korea: Rice Consumption and Stocks

Million tons

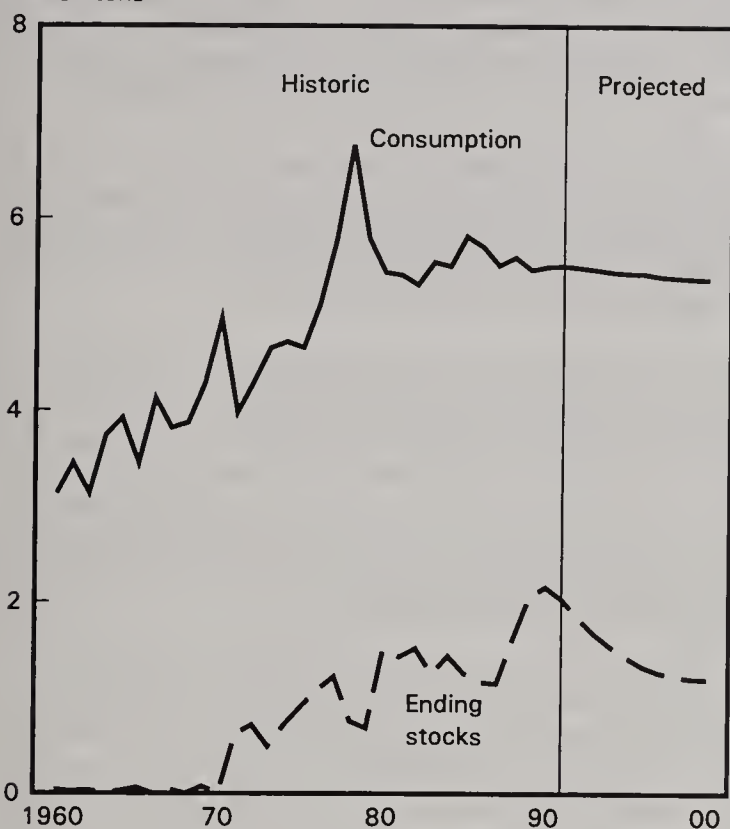


Figure K-6

South Korea: Cotton Consumption

Million tons

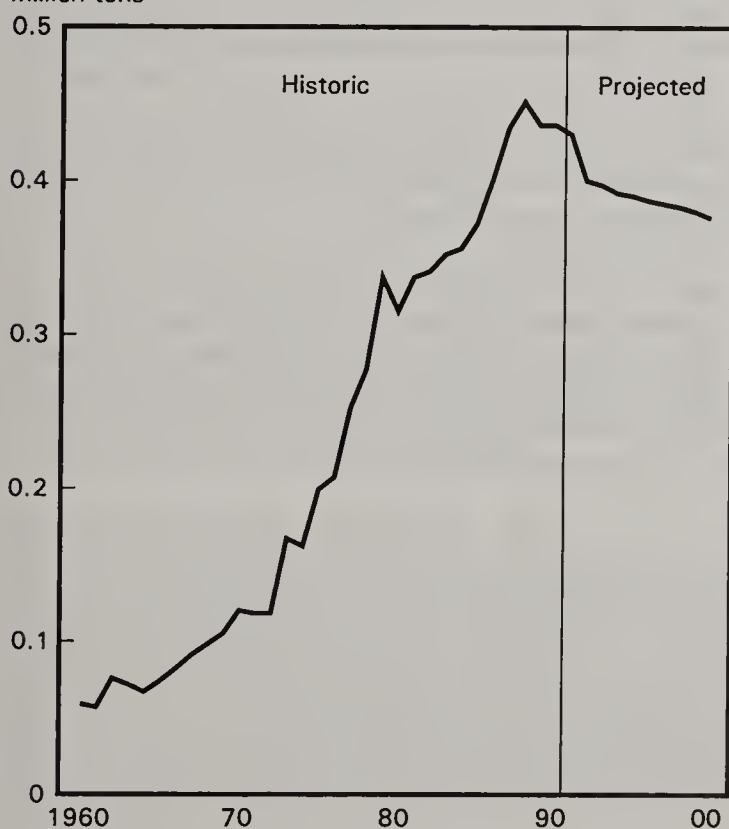


Table K-7. South Korea: Results of beef liberalization scenario

	2000			
	Base	Liberal- ization	Change	Value change
	--Thousand tons--		Percent	Million \$US
Net imports				
Wheat	3755	3718	-1.0	-4.5
Coarse grain	9821	9656	-1.7	-21.2
Soybean meal	853	808	-5.3	-8.8
Rapeseed meal	567	554	-2.3	-1.6
Other meal	463	453	-2.2	-1.0
Beef and veal	511	567	11.0	94.8
Total				57.8

Note: All oilseed meals on a soymeal-equivalent basis.

dica-influenced rice varieties, supply and demand will be in balance. This assumes that stocks, presently equivalent to over 35 percent of consumption, are reduced to 25 percent (figure K-5). If South Korea wishes to further reduce stocks, or if consumption slumps faster, it will have problems with oversupply and probably have to lower producer prices or divert area. Continued rice donations to foreign countries of 10-15,000 tons per year are assumed.

Cotton

Cotton use and imports are projected to fall by more than 10 percent in the 1990's (table K-3; figure K-6). Increasing competition in the spinning of yarn by cotton-producing countries, and in the manufacture of textile products by developing countries, are expected to reduce Korea's imports and use of both raw cotton and cotton yarn.

A Change in Trade Policy for Beef

One of the most important trade policy changes facing Korea in the 1990's is the pending liberalization of the beef trade in 1997. It is expected that South Korea will remove all barriers to beef imports in 1997, except the 25-percent tariff and such phytosanitary restrictions as the prohibition of beef imports from countries with foot-and-mouth disease. Such a scenario can be quite complex. At present, there are at least three beef markets in South Korea, and retail prices are available for only two of them. Given liberalization, Korea's beef market would likely become even more segmented. Also, the response of domestic producers to freer beef imports is difficult to assess, and depends in large part on government policy actions.

Therefore, the beef-liberalization scenario makes some sweeping simplifications. Domestic production is assumed not to change—protected by government actions that support

Table K-8. South Korea: Results of high income scenario

	2000			
	Base	High income	Change	Value change
	--Thousand tons--		Percent	Million \$US
Net imports				
Wheat	3755	3807	1.4	6.3
Coarse grain	9821	10054	2.4	29.9
Soybeans	1434	1471	2.6	9.8
Other oilseeds	113	114	.9	.5
Soybean meal	853	885	3.8	6.3
Rapeseed meal	567	583	2.8	1.9
Other meal	463	478	3.2	1.5
Soybean oil	24	25	0	.5
Other oil	398	407	2.3	3.9
Beef and veal	511	552	8.0	69.4
Poultry meat	31	33	6.5	3.8
Total				133.8

Note: All oilseed meals on a soymeal-equivalent basis.

cattle prices. Since even the cheapest beef in Korea today, frozen imported grass-fed beef, is sold at government-dictated prices well above the import value, there is clearly room for retail prices to fall. The scenario assumes a 15 percent drop in retail beef prices across the board, occurring in 1997.

The result is a \$95-million-dollar increase in beef imports by 2000, with import volume over 10 percent larger than in the first scenario. Although beef production and feed use are unchanged, beef imports substitute for some pork consumption at the lower price, and feed imports for pork production drop by \$37 million. The net result is a gain in agricultural import value of almost \$58 million in the year 2000, at 1991 import unit values (table K-7).

Alternate Economic Growth Scenario

Economic growth prospects in South Korea are linked to the global economy and trade, and actual rates are likely to vary from those in the first two scenarios. Alternative assumptions illustrate the effects of income changes on Korea's agricultural trade by varying the rate of growth by 1 percent more and less in each year. Only the higher-growth scenario is shown, because changes in the lower-growth projections are a mirror image of those in the higher-growth projections.

Table K-8 illustrates the higher-growth scenario. Livestock products, vegetable oils, and some minor commodities show a relatively strong, positive response to income change. Rice consumption is negatively correlated with income changes, and other commodities are not projected to change either way with income changes. Beef consumption rises the most, and most additional consumption is provided by imports. South Korea does not have the forage production base to easily

expand beef production at competitive prices. Consumption of pork and poultry meat also rises. There is a small rise in turkey meat imported as a substitute for pork in processed meats. Feed grain imports rise by \$36 million, mostly to accommodate new domestic pork and poultry production.

Vegetable oil use increases, boosting soybean imports by \$10 million in 2000. Oilseed meal imports rise by almost \$9 million, because meal demand rises faster than vegetable oil demand, so that more meal is needed than provided by the additional crush.

Since rice consumption falls and stocks are unsustainably high at the beginning of the projections, the assumption of no exports means that some rice area goes out of production. Cotton use is assumed unaffected by income growth inside Korea. Total trade in the commodities covered rises by almost \$134 million for the year 2000, using 1991 Korean import unit values to evaluate the changes. A lower-growth scenario shows trade falling by \$134 million.

Implications for U.S. Agricultural Trade

The United States is likely to gain from the growing import needs of South Korea in the 1990's. The United States has been successful in exporting beef to Korea, and should gain still more trade as Korea liberalizes meat trade. The United States supplies large quantities of beef, pork, and poultry meat to Japan, and would be competitive if new export opportunities emerged in South Korea. Gains in U.S. meat trade with South Korea should more than compensate for the lower value of U.S. grain exports to Korea.

The market for milling wheat is projected to remain flat, and competition from Canada and Australia is likely to intensify. The United States is likely to at least maintain its share of Korea's cotton imports because of a preference for the quality characteristics of U.S. cotton. However, the overall level of Korean cotton imports, and of U.S. cotton exports to Korea, is expected to continue to fall.

For some commodities, Korea is likely to become more particular about variety and quality. This will tend to increase the value of such imports. Korea's market for consumer products is gradually opening, and U.S. exporters should increasingly benefit from providing consumer-ready products such as convenience foods.

While the U.S. share of traditional Korean bulk imports, including feedgrains, wheat, and cotton, has fallen over the last 15 years, Korean demand for such products provides some benefit to U.S. producers because it bolsters international commodity prices. Some of the competition has come from Asian countries, including China, India, and Thailand, that are not expected to be large net exporters of some of the commodities in the future. Most of Korea's feedgrain needs are now provided by China (and various exporters of feed wheat). However, income growth and dietary changes in the Asian exporting countries will stimulate livestock sectors to use more of the feedstuffs the countries produce. If this occurs in the 1990's, the United States will gain back market share in grains and oilseed products.

Taiwan

Sophia Wu Huang

Abstract: Rapid economic development is expected to bolster food demand and foster restructuring of Taiwanese agriculture in the 1990's. Domestic crop output is projected to fall and livestock production to slow, which will contribute to rising imports of wheat, coarse grains, oilseeds, and beef.

Keywords: Taiwan, agriculture, policy, structural reforms, wheat, rice, coarse grains, oilseeds and products, animal products, cotton.

Introduction

Taiwan is an important and fast growing market for agricultural goods. It is one of the world's highest ranking net import markets for agricultural products and was the sixth most important U.S. overseas farm product market in 1992. Taiwan depends heavily on agricultural imports—feedstuffs to support domestic livestock production, cotton and hides for the export-oriented textile and leather goods industries, and wheat and powdered milk for foods.

The center of gravity of Taiwan's economy shifted rapidly away from agriculture during the fast economic development of the past decades. The contribution of agriculture (including forestry and fishery) to net domestic product decreased from 30 percent in 1960-64 to 4 percent in 1991. During the same period, agricultural trade changed from a surplus of \$54 million (in nominal value) to a deficit of \$2.5 billion, and the share of agricultural employment decreased from 50 percent to 13 percent.

Over this period, agricultural production and consumption also changed dramatically. Production of many crops declined, notably rice, sweet potatoes, and sugarcane. At the same time, output of livestock and a broad range of fruits and vegetables increased to meet growing domestic and, in some cases, foreign demand. The pattern of food consumption also changed. Because of increasing income, people could afford to consume more high-value products, such as meats and a wider variety of foods, instead of concentrating on traditional starch foods such as rice and sweet potatoes.

Economic Policies and Trends

Taiwan's trade-oriented policies have spurred strong growth in exports which in turn have sparked rapid economic growth, particularly since the mid-1960's. Real GNP grew at an average rate of 9 percent during the 1960's, and increased to more than 10 percent during the 1970's despite two oil-price shocks in the decade. Growth averaged more than 8 percent in the 1980's, but it slowed to an average of 6 percent during 1990 and 1991.

This performance has made Taiwan a showcase of economic growth. In addition, the growth has transformed Taiwan from an impoverished agrarian society into an affluent industrial

economy. Nevertheless, Taiwan's economy is still experiencing structural changes. Domestic expenditures now play a larger role in stimulating economic growth, and the role of exports, the main engine of growth until 1988, is declining.

Partly because of a relatively high interest rate, Taiwan has one of the world's highest saving rates. Increased consumer spending, however, has resulted in a decline in the saving rate. Savings reached a record 38 percent of GNP in 1986, but dropped to 28 percent in 1992, the lowest rate since the global energy crisis of 1975. Strong consumer spending is expected to continue to grow in part because of low unemployment, high real wage gains, strong local currency, and tariff reductions.

On the other hand, although domestic inflation remains low (less than 1 percent during 1985-88, but 4.8 percent during 1989-91), the currency appreciation, slower productivity growth, and increased labor costs have sapped export competitiveness, particularly for labor-intensive products. Taiwan, however, is increasingly exporting to many newly developed markets in southeast Asia and China. In particular, the boom in indirect trade between Taiwan and China has helped boost the island's trade performance.

While Taiwan's future economy will continue to depend heavily on exports, domestic expenditures by both consumers and government are expected to play a larger role in stimulating Taiwan's economic growth. Recently, in order to bring about a steady gain in productivity and international competitiveness, the government launched an ambitious 6-year (July 1991-July 1997) \$320 billion National Development Plan (NDP) to provide long-lasting support for economic growth. The projects in the plan will cover economic infrastructure, as well as a broad spectrum of tangible and intangible social infrastructure, including culture, education, and environment. By implementing the NDP, the government hopes to bring Taiwan into the 21st century as a fully developed nation—economically, socially, and culturally.

In January 1990, Taiwan applied for membership as a developed country in the General Agreement on Tariffs and Trade (GATT). In late 1992, a GATT working party was formed to review Taiwan's application, and Taiwan is likely to become a GATT member in the near future.

Trade Performance

Mainly as a result of strong export growth, Taiwan has consistently enjoyed a surplus in foreign trade since the early 1970's. The average trade surplus was \$600 million in the 1970's and reached \$9.9 billion in the 1980's. The consistent trade surpluses and steady interest income generated from foreign exchange reserves also resulted in a current account surplus for more than 10 years, averaging about \$9 billion a year during 1981-91. Taiwan's foreign exchange reserves rose from \$2.2 billion in 1980 to \$82.4 billion at the end of 1991—the largest in the world. Taiwan's gigantic foreign exchange reserves were equal to more than 50 percent of GDP and were enough to finance imports for more than a year. The large foreign exchange reserves and other foreign assets also made Taiwan one of the world's largest creditors in 1991.

For the next several years, Taiwan's large import requirements for the NDP projects, in addition to strong consumer demand, will keep import growth ahead of exports. Taiwan's trade surplus and current account surplus, however, are expected to remain large but decline substantially as a percentage of GDP. As a result, the exchange rate is expected to appreciate slowly over the next decade.

Agricultural Trends and Policies

Taiwan's postwar agricultural policy and programs were initially focused on increasing food production while transferring resources from the farm sector. Over the years, agricultural policy has changed drastically with social and economic conditions from taxing to subsidizing farmers. Trade barriers have been reduced substantially but remain restrictive. In the 1990's, partly due to Taiwan's effort to join GATT, agricultural policy is beginning to focus on structural adjustments to increase the sector's sustainability and import competitiveness. The dramatic changes during the past four decades, influenced by heavy government guidance, will continue to shape future developments.

Trends in Agricultural Production

Taiwan has subtropical and tropical climates and good irrigation. With year-round farming and multicropping, Taiwan's small family farms have produced a wide variety of crops, including rice, sugarcane, and various fruits and vegetables. With the government's emphasis on increasing agricultural production in the early years of economic development, Taiwan's postwar agriculture grew impressively before the late 1960's. Since then, agriculture has trended down. In the 1970's, agriculture's gross production still had a near 4 percent growth, in part because of rapid expansion in the livestock industry. In the 1980's, however, growth fell to only 2.6 percent (table L-1).

Rice is still the dominant crop in Taiwan, but its relative importance has diminished substantially. Despite the almost uninterrupted increase of post-war rice production until 1968, its decreasing importance was evident by the mid-1970's. The rice land diversion program initiated in 1984, which cut rice

Table L-1. Taiwan: Trends in agricultural production

	1960-1969	1970-1979	1980-1989
Percent			
Agricultural growth rate 1/			
Crops	4.1	1.5	-.3
Livestock	7.4	7.1	5.9
Total	5.2	4.0	2.6
Composition of products 2/			
Crops	74.0	65.8	61.1
Rice	37.7	29.9	20.9
Other common crops 3/	10.8	6.8	4.5
Sugar	5.7	5.1	4.0
Sweet potatoes	7.7	4.3	1.1
Fruits and vegetables	11.5	17.5	26.2
Others	.6	2.2	4.4
Livestock and products	26.0	34.2	38.9
Hogs	17.5	20.6	22.6
Chicken and eggs	4.0	7.8	11.3
Others	4.5	5.8	5.0

1/ Including agriculture, forestry and fishery.

2/ Based on current prices.

3/ Mainly coarse grains, peanuts and soybeans.

Source: Taiwan Provincial Department of Agriculture and Forestry. Taiwan Agricultural Yearbook, various issues.

production by more than one-fourth during 1984-91, further accelerated the decline. The value share of rice production in total output decreased from more than 40 percent in the early 1960's to 16 percent in 1991.

The production of coarse grains and soybeans, which was already minor, dropped rapidly after 1967 when the government modified its trade regulations by reclassifying imports of coarse grains and soybeans from the controlled to permitted category, prompting large imports. Although the government's current program pays farmers for diverting rice land to coarse grains and soybeans, production remains minor and imports are the principal source of feed for the livestock sector.

On the other hand, hog and chicken production has been transformed from traditional backyard, sideline farm operations into large business enterprises, benefiting from the government's guidance and trade protection, and liberalization of coarse grain and oilseed imports. Pork became the leading agricultural export in the late 1980's, and hog production surpassed rice as the most valuable agricultural product in 1985. However, the hog industry may face cuts in the near future because of increasing water pollution problems associated with hog wastes. The role of the chicken and egg sector also expanded during the past four decades, but Taiwan's poultry has not yet achieved international competitiveness.

Trends in Agricultural Trade and Consumption

Taiwan began its postwar economic development as an agricultural exporter. Agricultural exports, once the main source of foreign exchange earnings, contributed much in financing the required capital goods imports for economic development. Taiwan's agricultural exports, however, are now relatively minor. In particular, rising production costs have caused many of the formerly prominent agricultural exports, including rice, sugar, and canned products, to lose ground in the international markets. The sharp appreciation in Taiwan's dollar against the U.S. dollar between 1985 and 1991 further reduced the competitiveness of farm exports.

While the role of agricultural exports is fading, there has been an upward trend in imports of agricultural products. Because of limited resources and climate constraints, Taiwan has to depend almost totally on imports of inputs for its modern livestock, flour milling, and export-oriented textile and leather goods industries. Fast growth in these industries has spurred the rapid rise of import demand for these products. In addition, increasing income and relaxed trade barriers since the 1980's also have stimulated imports of fruits, nuts, and vegetables as well as dairy products and beef to satisfy Taiwan's increasingly diversified tastes. As a result, Taiwan has reversed its agricultural trade balance from surplus to deficit since 1970.

The changes in agricultural production, together with the relaxation of import controls, are closely related to the changing patterns of food consumption (see table L-2). Among the significant changes, per capita consumption of rice, the main staple for the majority of people in Taiwan, has decreased steadily since the late 1960's. The average rice consumption in 1990 was only half that in the 1960's. Per capita consumption of sweet potatoes decreased drastically to negligible levels by the end of the 1980's, while per capita meat consumption more than doubled over the three decades, and fruit and vegetable consumption increased substantially.

Table L-2. Taiwan: Per capita consumption of major commodities

	1960-1969	1970-1979	1980-1989
Kilograms/year			
Rice	136.2	127.0	84.4
Sweet potatoes	46.4	11.3	1.9
Meats	20.3	30.6	51.7
Eggs	2.4	5.5	10.3
Fish	27.4	35.6	39.3
Milk	6.2	16.3	31.0
Vegetables	59.6	105.2	122.2
Fruits	27.5	54.1	83.9

Source: Council of Agriculture. Taiwan Food Balance Sheet, various issues.

Issues Affecting Agricultural Trade in the 1990's

Three of the most important issues that could affect Taiwan's trade in the 1990's are income growth prospects, structural reform, and agricultural trade liberalization. Future import demand depends heavily on prospects for income growth. Structural reform and agricultural trade liberalization would be complementary, with the latter satisfying the repeated access demands of foreign food suppliers and putting cost-cutting pressure on Taiwan's farmers.

Income Growth Prospects

After decades of fast growth, Taiwan's economy in the 1990's is facing rising wage rates, expensive land costs, and stricter environmental controls, in addition to a strong currency. In particular, Taiwan can no longer compete in making labor-intensive and low-tech products for international trade. Instead, Taiwan's manufacturers must move to the high-tech areas where labor costs matter less than capital and technology.

The government's regulated economic policies were largely responsible for Taiwan's rapid growth for the past four decades. In the 1990's, the government's goal, by adopting the \$320 billion so-called National Development Plan, is to usher Taiwan across the threshold from a newly industrializing economy to a fully developed nation by the end of the century.

Given the huge wealth that Taiwan has accumulated, there is little doubt that the government is capable of completing such a plan. As a result, despite some uncertainty regarding the future rate of economic growth, most economists project that Taiwan's economy will enter a period of sustained growth in the 1990's. Although economic expansion is unlikely to continue at double-digit rates as in the past, growth is expected to be relatively high by international standards.

The base scenario assumes Taiwan's real GDP growth will average 6.4 percent per year in the 1990's. In addition, the population growth rate is projected to continue its decline, from 1.02 percent in 1993 to 0.87 percent in 2000. Consumer prices are assumed to remain stable, with the inflation rate at 2.7-3.9 percent, while the exchange rate is expected to appreciate moderately but continuously.

Agricultural Structural Reform

After intense economic development in past decades, Taiwan's agriculture is facing unprecedented challenges as the last decade of the twentieth century gets underway. Rising production costs, a shrinking and aging supply of farm labor, lack of an efficient farming scale, and dwindling water resources have put heavy pressure on agriculture for structural reform. In addition, other constraints on Taiwan's overall economy—concern for pollution, currency appreciation, labor shortages—have also indirectly pushed Taiwan's agriculture to reform. In fact, since Taiwan applied GATT membership in 1990, there has been a sense of urgency and inevitability for the government thoroughly restructure agriculture.

To balance the interests of a declining agricultural industry and rural population with the trade liberalization demands of

international trading partners and local consumer groups, the government recently adopted a package of ambitious and comprehensive agricultural restructuring programs in its 6-year (July 1991-June 1997) Integrated Agricultural Adjustment Plan (IAAP). The plan is a complementary part of the new 6-year National Development Plan.

In the IAAP, for the first time, the government has modified its policy in agricultural production from more is better to minimum self-sufficiency. While proposing to reduce some farm production, the government will, at the same time, promote those farm products that are potentially competitive or politically sensitive, using marketing, technology, returns to labor, environmental costs, and implications for food security as selection criteria.

Livestock industries and aquaculture have been singled out for reduction to alleviate the growing concerns about environmental pollution and ground water depletion. In particular, in January 1991, the government announced the Hog Adjustment Plan, which called for a 26 percent drop in hog numbers during the 6-year period. In other words, Taiwan's new hog policy is to switch from the current export-oriented production to domestic market supply only.

Although the broad message of the IAAP is that Taiwan is taking agriculture structural reform seriously, many measures of the plan are still being debated. Some effects of the structural changes, such as those related to the rice land diversion program and pork production, however, are considered in the projections for Taiwan's future.

Agricultural Trade Liberalization

Taiwan began its heavy agricultural protection in the early 1970's when policy was reoriented from agricultural taxation to subsidization. The government has made significant efforts to intervene in agriculture, the dominant forms being high tariff rates on many high-value foods and import restrictions on major products such as rice and chicken meat. Taiwan's trade policy, however, is increasingly a focal point of friction, and the country has been under increasing pressure to open its agricultural market. The pressure has been intensified since the mid-1980's, with the rapid growth in the trade surplus with the United States, Taiwan's largest market.

Although Taiwan has reduced some trade barriers and import controls, tariffs on many agricultural imports remain high, and other import barriers, such as bans, import licensing restrictions, and unique sanitation or purity standards, persist. In addition, Taiwan's agricultural trade liberalization has met great resistance, especially after the lifting of the 38-year martial law in July 1987. Taiwan's farmers, long obedient and staunch supporters of the government, have begun to take more rebellious action against its trade liberalization policy. In fact, farmers' discontent with agricultural trade policy has received considerable political attention and has complicated the liberalization process.

Because of eagerness to join the GATT, however, Taiwan is planning to make some necessary changes in its trade policy. In particular, the policy initiatives spelled out in the IAAP

propose some guidelines on agricultural trade liberalization, with production and marketing assistance to farmers whose product sales have been adversely affected by imported goods. Thus gradual trade liberalization on farm imports appears likely after Taiwan is accepted for GATT membership. Policy changes, however, are likely to be incremental, with a timetable for gradually reducing trade barriers. As a result, trade effects would be kept to a minimum.

Agricultural and Trade Prospects to 2000

Taiwan's production of most crops, such as rice and coarse grains, and growth of most livestock, such as pork and poultry meat, will slow from the 1980's levels (tables L-3 to L-6). Consumption of rice, pork, and poultry products will be directly related to production because substantial trade barriers still exist, while imports will play a major role in meeting wheat, feedstuffs, and beef demand. Except for beef, import growth is projected to be slower because of a decline in demand for wheat from the aquaculture industry and slower growth in the demand for feedstuffs from most livestock industries.

Wheat

Restricted by a subtropical climate and low incentive policy, wheat has been a minor crop in Taiwan. Since the 1980's, the planted area has stabilized at about 1,000 hectares, with production at 2,000-5,000 tons, depending on yield. The situation is assumed to continue in the 1990's. On the other hand, food consumption of wheat will increase as the income and population grow and the diet is westernized. Growth in wheat consumption, however, will be slower than in the 1980's, mainly because of the expected decline in the aquaculture industry which uses wheat flour as a binder and nutrient in shrimp feed.

Although the data on feed use of wheat have not appeared officially, demand for feed consumption is implicitly included in the calculation of total demand for wheat in the projection. Taiwan's wheat is supposed to be used only for food; no feed manufacturer is allowed to import wheat. Rising land and production costs and environmental concerns have limited the growth of the shrimp industry since the late 1980's.

One major assumption is that wheat import demand will not be affected by liberalization. Yielding to the repeated petitions from the bakers' association for trade liberalization on wheat imports, the authorities have announced some changes in import procedures. Taiwan, however, is not expected to completely liberalize its wheat imports in the next few years, except for some relaxation to allow nonmembers of the Flour Millers Association to import wheat. In addition, the imports of wheat flour and processed wheat products continue to be highly restricted. Thus, Taiwan has to obtain its wheat supply mainly through the import of unmilled wheat.

Rice

As the most important crop, rice production has received the heaviest government intervention over the years. The current rice land diversion program, however, is not expected to be renewed after it ends in 1995 because of the government's

Table L-3. Taiwan: Base projections for crops

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Thousand tons-----			---Percent---	
Rice					
Area (Mil. ha)	675	453	405	-3.9	-1.1
Yield (Kg/ha)	3.27	3.72	3.67	1.3	-.1
Production	2202	1684	1486	-2.6	-1.2
Imports	4	5	5	.7	1.4
Exports	219	119	86	-5.9	-3.2
Consumption	1900	1608	1412	-1.7	-1.3
Food	1900	1608	1412	-1.7	-1.3
Per cap.(Kg)	106.7	78.7	62.9	-3.0	-2.2
Feed	0	0	0	.0	.0
Ending stocks	798	745	386	-.7	-6.4
Wheat					
Area (Mil. ha)	1	1	1	.0	.0
Yield (Kg/ha)	2.67	4.00	4.00	4.1	.0
Production	3	4	4	4.1	.0
Imports	649	836	965	2.6	1.4
Consumption	658	863	968	2.8	1.1
Food	658	863	968	2.8	1.1
Per cap.(Kg)	37.0	42.3	43.1	1.3	.2
Feed	0	0	0	.0	.0
Ending stocks	103	121	116	1.7	-.4
Coarse Grains					
Area (Mil. ha)	43	104	100	9.2	-.4
Yield (Kg/ha)	3.00	5.00	5.00	5.2	.0
Production	117	491	470	15.4	-.4
Imports	3636	5693	6719	4.6	1.7
Consumption	3701	6007	7171	5.0	1.8
Food	211	327	304	4.5	-.7
Per cap.(Kg)	11.87	16.06	13.54	3.1	-1.7
Feed	3490	5680	6867	5.0	1.9
Ending stocks	757	1074	1226	3.6	1.3

intention to decrease the market-distorted agricultural protection and the possibility of balancing rice production and consumption.

Compared with the sharp drop in rice production in the 1980's, output is projected to decrease gradually, while stock levels drop substantially. After two consecutive 6-year rice land diversion programs (1984 and 1990), Taiwan is not expected to face a severe rice surplus problem any more. In addition, rice farming has become less attractive to farmers because of no new incentives and an aging workforce.

With a negative income elasticity (assumed -0.3), rice consumption per person is projected to decline further as incomes rise and diets diversify. The glutinous rice imports are pro-

jected to be 5,000-6,000 tons annually, in line with population growth. Other kinds of rice imports, however, are assumed to be banned by the government. Rice exports will remain small and decrease in the 1990's.

Coarse Grains

The likely major policy change related to the coarse grain sector is the abolition of incentives to farmers for diverting rice land to coarse grain production. The baseline projection assumes that the protective policy on coarse grain will be terminated after 1995 when the diversion program ends.

Domestic coarse grain production, which is minor but increased substantially in the 1980's, will remain steady before declining after 1995. Because all livestock sectors are forecast to show at least modest growth, import demand and consumption for coarse grains will rise at a lower rate than in the 1980's. The self-sufficiency ratio for coarse grains is projected to drop from the current 8 percent to 7 percent in 2000.

Soybeans and Soymeal

Unlike coarse grains, soybean production was flat in the 1980's, despite a high official purchase price. In the 1990's, no increase is anticipated, and domestic soybean production is expected to remain negligible. As a result, the growing livestock sector and the rising demand for food use (which accounts for about 10 percent of total soybean consumption) will increase soybean imports.

In line with the expected growth of livestock production, soybean production and consumption are projected to rise, but slower than in the 1980's. Soybean trade is projected to be minor because Taiwan will continue to use mainly domestically crushed soybean meal from imported soybeans. Following trade liberalization of soybeans in 1988, Taiwan no longer restricts meal imports except from China. Thus imports will occur if quality, delivery, and price are right. Annual imports of 200,000-250,000 tons, about the same as the last 3 years, are projected in the 1990's.

Beef and Veal

After several unsuccessful attempts for beef cattle development, Taiwan's beef production in the 1990's is expected to remain small. Compared with the 1980's, beef production is projected to increase slightly, mainly from slaughter of growing dairy herds.

Beef consumption, which grew substantially in the 1980's, is projected to rise continuously in the 1990's as real prices decrease, income rises, and diets change. Beef and veal are most sensitive to income and price changes. Income will be the principal source of growth. As in the 1980's, Taiwan's beef consumption will continue to depend on imports. In addition, because of strong demand, Taiwan's self-sufficiency in beef is projected to decline from the current 8 percent to about 5 percent in 2000.

Table L-4. Taiwan: Base projections for oilseeds

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
-----Thousand tons-----					
---Percent---					
Oilseeds					
Area (Mil. ha)	64	40	39	-4.5	-.3
Yield (Kg)	1.61	1.94	1.93	1.9	-.1
Production	103	78	75	-2.7	-.4
Imports	1075	2013	2897	6.5	3.7
Consumption	1200	2094	2965	5.7	3.5
Ending stocks	160	405	367	9.7	-1.0
Soybeans					
Area (Mil. ha)	11	4	4	-9.6	.0
Yield (Kg)	1.61	2.00	2.00	2.2	.0
Production	18	8	8	-7.8	.0
Imports	1064	1981	2841	6.4	3.7
Consumption	1103	1992	2845	6.1	3.7
Ending stocks	157	402	283	9.8	-3.4
Total meals					
Crush	941	1754	1880	6.4	.7
Yield (Kg)	.77	.78	.78	.1	.0
Production	728	1377	1466	6.6	.6
Imports	175	660	708	14.2	.7
Exports	1	1	1	.0	.0
Consumption	900	2035	2171	8.5	.6
Ending stocks	74	51	70	-3.7	3.2
Soy meal					
Crush	913	1717	1840	6.5	.7
Yield (Kg)	.78	.79	.79	.1	.0
Production	716	1356	1454	6.6	.7
Imports	0	204	250	77.3	2.0
Consumption	719	1560	1703	8.1	-.9
Ending stocks	59	51	59	-1.4	1.5

Pork

Under the Hog Policy Adjustment Plan, Taiwan proposed to cut hog slaughter 26 percent by 1997 because of environmental concerns. So far, the plan has not had much effect. Since it was proposed in January 1991, the government has said it will compensate hog farmers along major rivers NT\$600 (\$24) per head if they cease operations. In addition, a new chemical oxygen demand requirement in waste water went into effect on January 1, 1993, and tighter regulations are expected to be enforced in January 1998. The plan, however, will not succeed as long as hog farming is profitable and production meets the waste water requirements.

Table L-5. Taiwan: Base projections for meats

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
-----Thousand tons-----					
---Percent---					
Beef					
Production	6	5	6	-1.7	1.2
Imports	15	48	108	12.2	8.4
Consumption	22	54	114	9.5	7.8
Per cap.(Kg)	1.21	2.63	5.08	8.0	6.8
Pork					
Production	547	1014	1217	6.4	1.8
Exports	25	228	185	24.6	-2.1
Consumption	521	785	1032	4.2	2.8
Per cap.(Kg)	29.27	38.42	45.97	2.8	1.8
Poultry					
Production	251	476	700	6.6	3.9
Exports	1	5	5	10.8	.7
Consumption	250	472	695	6.5	4.0
Per cap.(Kg)	14.03	23.08	30.96	5.1	3.0

Despite the current high levels of meat and fish consumption, forecasts envision further growth for pork as income and population growth expand total consumption. Compared with the 1980's, however, the consumption growth rate is projected to be slightly slower because of the existing high pork consumption.

Pork exports, after surging in the 1980's and peaking in the early 1990's, are now expected to decline slightly, mainly because of increasing production costs. Imports are projected to remain negligible, because people prefer the taste of fresh pork to frozen pork. Although imported frozen pork has potential for processing when local hog prices are high, the government's import ban on low-quality cuts (cuts from other than hams, shoulders, tenderloins, and loins) is assumed to continue for the current baseline projection, and thus pork imports will be negligible. With growing consumption, substantial exports, and negligible imports, pork production is likely to rise in the 1990's, but more slowly than in the 1980's.

Poultry

Similar to the 1980's, the strongest growth in the meat category for both production and consumption is expected to take place in poultry meats, primarily in the broiler sector. In addition to strong demand for poultry meat, the government's efforts to strengthen the marketing efficiency of the industry will help. The government's emphasis is on strengthening the industry against the threat of possible future trade liberalization of broiler imports. Taiwan is particularly vulnerable to imports of poultry parts, such as chicken and duck wings and legs, which are favorites and command higher prices than white meat in the market.

Table L-6. Taiwan: Base projections for cotton

	Growth rates				
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
	-----Thousand tons-----			---Percent---	
Cotton					
Production	0	0	0	.0	.0
Imports	243	324	291	2.9	-1.1
Exports	0	0	0	.0	.0
Consumption	216	338	293	4.6	-1.4
Ending stocks	125	114	117	-.9	.2

Although Taiwan intends to set up a timetable for trade liberalization in its 6-year Integrated Agricultural Adjustment Plan, no actual broiler imports are projected. Some penetration caused by the September 1990 liberalization of turkey and whole duck imports, however, is projected, but at modest levels. On the other hand, except for duck meat, no poultry exports are expected because of high production costs. Duck meat exports, though minor (about 5,000 tons annually), are much higher than in the 1980's.

Cotton

Taiwan's textile industry has depended on cotton imports since the early 1960's when the government designated this sector a leading industry for economic development. Taiwan's domestic cotton production is not only negligible but also poor in quality. Most of Taiwan's imported cotton is processed and re-exported. Thus consumption of and import demand for cotton in Taiwan are dictated by the international competitiveness of its finished products.

Rising labor costs, a strong local currency, and likely summer power shortages are the main factors that will cause Taiwan's labor-intensive, export-led textile industry to decline in the 1990's. In fact, many firms have already shifted their operations to lower cost countries in southeast Asia and China. In addition, Taiwan's strong currency and lower tariffs during the past several years have created markets for importing finished garments, cloth, and yarn, and thus are displacing some demand for importing cotton. As the industry is likely to decline, cotton imports and domestic consumption, which surged in the 1960's, 1970's, and peaked in the mid-1980's, are projected to decrease in the 1990's, while production remains negligible.

Alternate Income Growth Scenario

An alternate income growth scenario estimates the trade effects of stronger economic growth by increasing the real GDP growth rate 1 percent from that assumed in the base projections. As shown in table L-7, the major changes in trade are an increase in rice exports, and higher beef, coarse grain, and soybean imports.

Table L-7. Taiwan: Results of high-growth scenario

	2000		
	Base	High	Change
	Growth		
	-----Thousand tons-----		Percent
Net imports			
Rice	-81	-114	40.74
Coarse grains	6719	6883	2.44
Soybeans	2841	2913	2.53
Beef and veal	108	116	7.41

Note: All oilseed meals on a soymeal-equivalent basis.

Changes in economic growth will increase the consumption of all the other products covered in the projections. Rice is the only commodity with a negative income elasticity. As a result of a decrease in rice consumption, surplus rice for exports would increase by about 40 percent in 2000.

On the other hand, the increased domestic consumption of pork and poultry will raise production because of the government's restrictive import policy on these two commodities. Furthermore, because of insufficient domestically produced feedstuffs, increased meat production will raise imports of both coarse grains and soybeans by about 2.5 percent. In comparison, the rise in beef consumption stimulated by high income growth would be met by a 7 percent increase in imports. After several unsuccessful attempts for beef cattle development, the government allows imports to take care of most of the demand.

Alternate Pork Production Scenario

The Hog Adjustment Plan has been difficult to put into practice because it lacks binding force on farmers. Pork production, however, will be increasingly subjected to rising labor costs and environmental and safety inspection, when tighter regulations are put into effect in January 1998.

Table L-8. Taiwan: Results of no-pork-exports scenario

	2000		
	Base	No-pork	Change
	-exports		
	-----Thousand tons-----		Percent
Net imports			
Coarse grains	6719	6137	-8.7
Soybeans	2841	2585	-9.0
Other oilseeds	47	46	-2.1
Pork	-185	0	-100.0

Note: All oilseed meals on a soymeal-equivalent basis.

Table L-8 illustrates the net imports in the year 2000 under the scenario in which Taiwan's pork production is only for the local market with no more exports after 1998. Corresponding with the 100 percent drop in pork exports in 2000 is an estimated 9 percent drop in imports of both coarse grain and soybeans.

Conclusions

The projections for Taiwan's agriculture in the 1990's are for a decline in most crop production, and for imports to continue to dwarf domestic production for coarse grains, oilseeds, wheat, cotton, and beef. Compared with the 1980's, the negative growth of rice production is expected to slow because of the completion of the rice land diversion program. For the same reason, the production of coarse grains, which are target crops for the diversion program and surged in production during the 1980's, is projected to drop slightly in the 1990's. Oilseed production, which has decreased since the late 1980's, is projected to decline further in the 1990's. On the other hand, while livestock production is projected to increase modestly in the 1990's, its growth rate will be slower than in the 1980's despite the assumption that major trade barriers remain.

Taiwan's agricultural trade liberalization depends in part on domestic structural adjustments. Taiwan has expressed repeatedly its willingness to bring agricultural support and trade policies in line with GATT requirements. Significant agricultural liberalization measures, however, await the disposition of Taiwan's GATT application. Even then, policy changes on trade liberalization are not likely to be abrupt; they usually come with a timetable. In the interim, Taiwan probably will make only modest reforms with little immediate trade effects.

Because Taiwan has had to depend almost totally on imports for its livestock, flour milling, and export-oriented textile and other industries, bulk commodities will continue to dominate agricultural imports in the 1990's. However, growth likely will be slower than in the 1980's. In particular, high production costs and a strong currency will cause export-oriented and labor-intensive industries to decline. As a result, while beef imports will grow substantially and growth for wheat, coarse grain, and oilseed imports will be slower than in the 1980's, the growth for cotton imports will be negative.

During the past two decades, Taiwan was the fastest growing market in the Pacific Rim for U.S. agricultural exports. With rising incomes, a growing preference for western-style foods, and a dwindling domestic agricultural sector, growth should continue. In addition to bulk commodities, exporters are increasingly targeting Taiwan with high-value products that Taiwan cannot provide competitively. For example, U.S. products, such as deciduous fruits and fruit juices, and special beef cuts, are considered by analysts to have the greatest potential for export to Taiwan. In short, as the largest supplier of Taiwan's farm imports, the United States is in a good position to increase its agricultural exports, including high-value products.

BOX 10

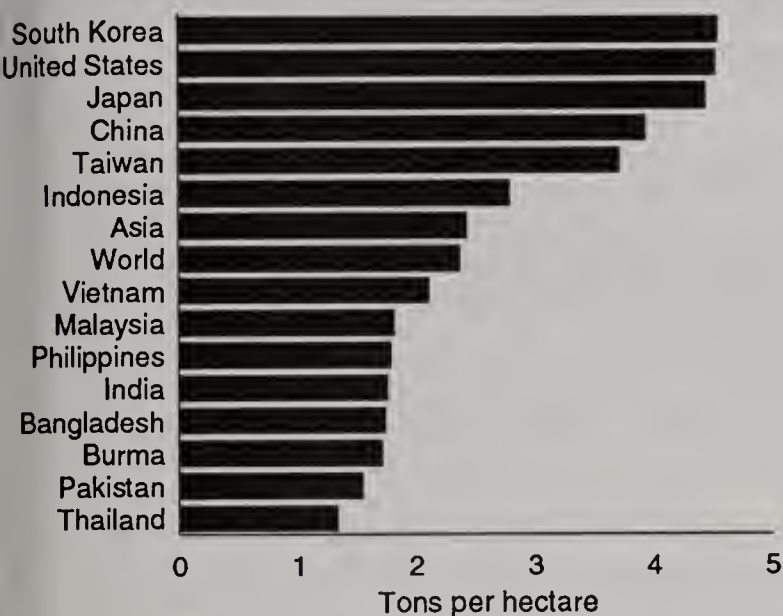
Relative Crop Yields in Asia

Per hectare productivity of major crops differs substantially across Asia, reflecting great diversity in stages of economic development, agroclimatic conditions, and policies. Because of variations in soil quality, water availability, and climate, all countries probably will not achieve the maximum yield for each crop. However, yield comparisons provide a crude means of evaluating prospects for productivity gains across Asia.

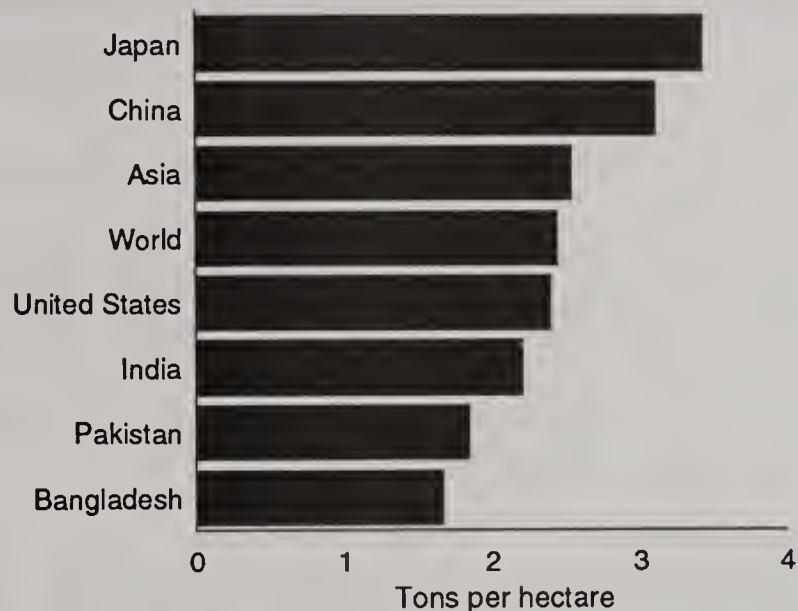
- With the possible, key exception of China, rice yields may remain relatively poor in most of the lower-income Asian countries where growth in rice demand remains strongest. Rising demand in these countries may be met by gains in domestic productivity. Also, yields remain low among the region's major rice exporters, particularly Thailand.
- Wheat yields in the major Asian producing and consuming countries, China and India, are either near or above the U.S. and world averages, suggesting limits to future productivity growth. On the other hand, the high yielding varieties cultivated in Asia have more potential than those grown in the United States, and soil and water resources are generally good.
- Asian corn yields are well below those in the United States, and U.S. yields may be unattainable in the agroclimatic conditions present in much of Asia. Prospects for boosting corn yields appear to be strongest in China, Thailand, Indonesia, and India, but the extent to which such gains will be achieved and help meet Asian feed grain demand is uncertain.
- Soybean yields in Asia are low relative to world and U.S. averages, and agroclimatic conditions may make significant improvement unrealistic. China and India have substantial potential, but production in most other countries is protected and inefficient.
- Cotton yields in the major producing countries of China and Pakistan are high by world standards, and climate and irrigation may support further gains. Growth in Pakistan remains particularly strong, and India is a low-cost producer with broad potential for improvement.

Yields for Selected Countries

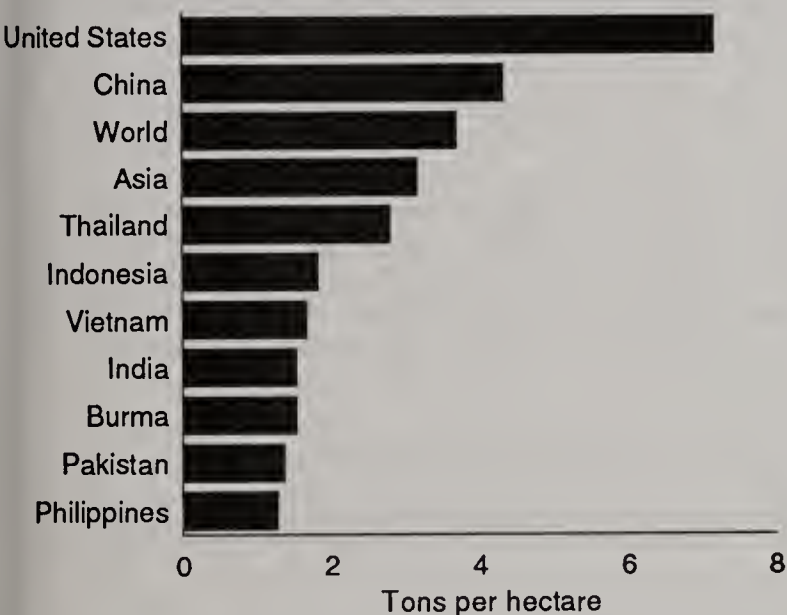
Rice



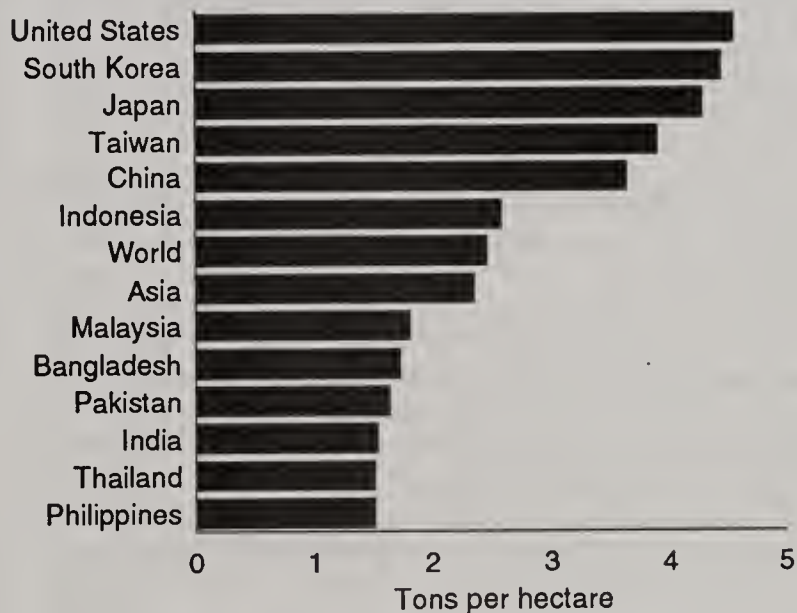
Wheat



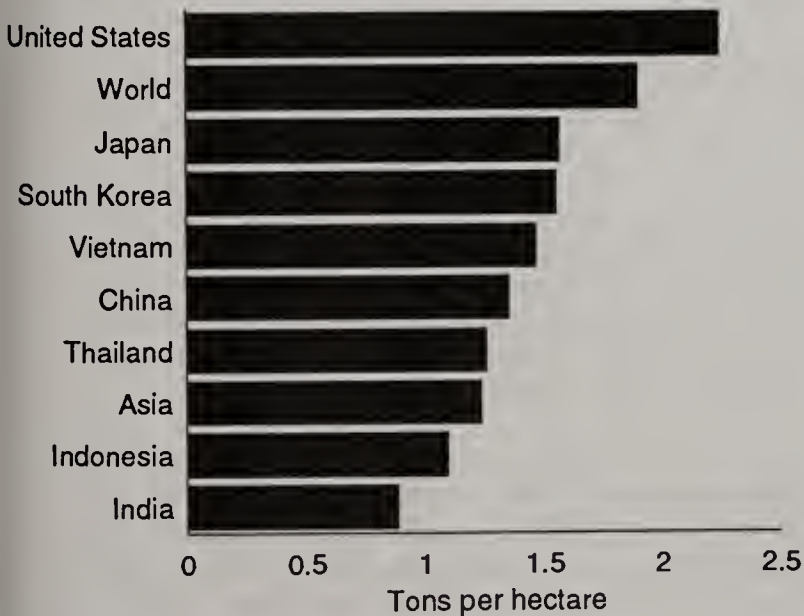
Corn



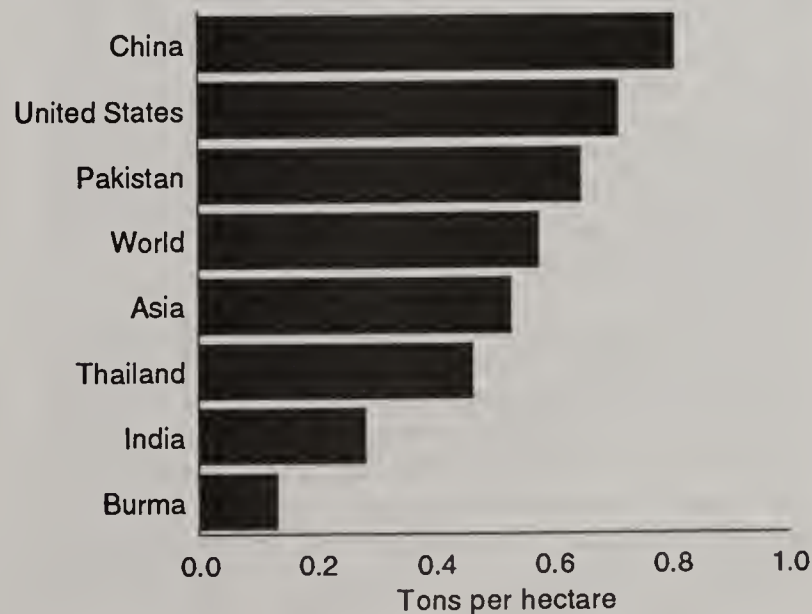
Total Grain Yields



Soybean



Cotton



Thailand

Mark Giordano and Terri Raney

Abstract: Thailand is expected to sustain dynamic growth in the 1990's. Wheat imports are projected to expand rapidly, and a booming feed-livestock economy is expected to curb corn exports and boost imports of feed protein. At the same time, exports of rice and poultry meat are projected to remain strong.

Keywords: Thailand, agriculture, trade, policy, wheat, rice, corn, cassava, soybeans and products, meats, cotton.

Introduction

Thailand's recent economic performance has been spectacular, even by the standards of the other dynamic economies of the region. Annual growth of real Gross Domestic Product (GDP) has averaged nearly 7 percent since 1950 and a phenomenal 9.9 percent over the past 5 years. Much of this success has resulted from aggressive government efforts to promote industrial development and diversification based on a relatively open trade and investment environment, competitive private enterprise, and fiscal and monetary restraint. The Thai Government has shown a remarkable willingness to experiment with alternative development strategies, to adapt to changing global forces, and to provide a stable macroeconomic environment.

At the end of World War II, Thailand was essentially an agrarian nation, with about 85 percent of the population engaged in agriculture, primarily subsistence rice farming. Rice alone accounted for a quarter of GDP and half of exports, while the manufacturing sector provided less than a tenth of GDP and virtually no exports. By 1990, manufacturing and service sectors accounted for almost 80 percent of GDP and 55 percent of total exports.

Despite the increasing importance of the manufacturing and service sectors, agriculture still provides about 20 percent of GDP and almost 45 percent of exports. The agricultural sector itself has become more diversified in recent decades. Rice now accounts for only about 30 percent of agricultural production and 20 percent of agricultural exports. Livestock and fishery products have become much more important and now provide, respectively, about 23 and 14 percent of agricultural production and 4 and 22 percent of agricultural exports. Other important farm products include corn, cassava, sugar, oilseeds, fruits, vegetables, and natural rubber.

The United States is Thailand's largest export market, absorbing about 20 percent of Thai exports. Thailand's agricultural exports to the United States (excluding fishery products) amounted to \$518 million in 1991, of which 37 percent consisted of fruits and vegetables. Grains and animal feeds made up 21 percent, and rubber and coffee accounted for 17 and 7 percent, respectively. In addition, the United States imports a significant amount of fresh and frozen prawns from Thailand, valued at approximately \$68 million in 1988.

Thailand remains a net agricultural exporter, but imports large quantities of cotton, animal feeds, fertilizers, livestock products, and fish. Cotton is by far the largest U.S. agricultural export to Thailand, with 40 percent of 1991's \$287-million total. Thai cotton imports have increased rapidly to supply the expanding export-oriented textile industry. Tobacco, wheat, fruits, vegetables, and animal feeds account for the majority of other U.S. agricultural exports to Thailand.

As in other rapidly developing Asian countries, the traditional Thai diet is changing to include more animal protein, fruits, vegetables, and wheat-based products, while reliance on rice declines. Pork and poultry production, consumption, and exports have grown rapidly in the last decade. Beef and dairy output have expanded more slowly than demand, leading to increased imports, while imports of high-value products like tobacco, fruits, and vegetables have grown along with per capita incomes.

Economic Policies and Trends

Thailand's impressive 7 percent average real growth over the past four decades has transformed the country from a traditional agricultural economy to a modern, manufacturing- and service-based economy with a per capita income of \$1,420 in 1990. This success has not come without problems, however, and several challenges must be addressed if Thailand's economic miracle is to continue in the 1990's.

First, although the government invested strongly in infrastructure throughout the postwar period, the economic boom of the late 1980's has outstripped the capacity of existing transportation and communication networks, and infrastructure bottlenecks may inhibit growth in the 1990's. Second, despite the rapid rise in average per capita incomes, growth has been concentrated in Bangkok and the surrounding region, while incomes in rural areas, particularly in the North and Northeast, have lagged. Finally, political instability may constrain future economic growth if intensifying demands for greater human rights protection and democracy are not satisfied.

The government recognizes the need to improve the country's physical infrastructure, and has increased public investment substantially since 1989. In addition, the government has given the private sector a leading role in several large infrastructure projects, including a major expansion of the tele-

communications network and the development of a light rail system in the Bangkok area. Public sector investment has been targeted toward expanding seaport facilities, highways, and airports.

The government considers its chief role is to maintain a stable macroeconomic environment, and toward that end has kept inflation below 6 percent through the previous decade. Tight monetary policy has pushed domestic interest rates above 16 percent, with the result that private sector external borrowing has grown rapidly in the past few years. Foreign direct investment has also expanded rapidly, giving Thailand a large capital account surplus. Surging imports of raw materials and intermediate goods have contributed to a growing current account deficit, but policy makers appear to view such imports as healthy because they promote manufacturing.

The government takes very seriously the need to spread Bangkok's economic success to the rural areas of the North and Northeast. Per capita income averaged about \$3,700 in Bangkok in 1989, but less than \$470 in the Northeast. The government is pursuing a broad-based strategy that includes fostering industrial development and expanding educational and health services in rural areas, and redistributing income by reforming the tax system. The government is also relying on continued general economic development to spread the wealth into rural areas.

The challenge of maintaining political and economic stability in the face of rising demand for democratic reform and expanded human rights protection is a vexing one for Thai authorities. The military coup in February 1991 and the subsequent violent clashes between pro-democracy demonstrators and the military in May have tarnished Thailand's image abroad and raised concerns that the economic miracle of the 1980's may be derailed. The military has traditionally played a strong role in Thai politics, but as the population has become more educated and affluent, demands for freer political expression have grown.

The recently elected civilian government of Prime Minister Chuan Leekpai has resisted military involvement in Thailand's foreign relations and has permitted an international non-governmental panel to examine human rights violations in Thailand. The political climate appears to have stabilized and, if history is a guide, politics are unlikely to interfere with economic development even if it means granting more democratic freedoms.

Trade Performance and Policies

The government has maintained a relatively open trade and investment environment since the mid-19th century. Under the Bowring Treaty between Britain and Thailand, signed in 1855, Thailand agreed to allow free trade in almost all products including gold and silver, to keep import duties at or below 3 percent, and to limit the use of export taxes. Following implementation of the Bowring Treaty and similar treaties with other industrial countries, Thailand became an almost completely open economy. In the ensuing 100 years, Thai economic development rested almost exclusively on exports of agricultural products, primarily rice.

During the 1950's, the government began to aggressively promote industrial development based on state-owned enterprises, but that strategy was quickly abandoned as being inefficient. Since 1959, the government has relied on the private sector to carry out industrial development. The Board of Investment (BOI) was created to promote import-substituting industries, while direct government involvement was limited to infrastructure development. In the tradition of the Bowring Treaty, tariff rates ranged from 15 to 30 percent and remained low compared with other developing countries through the 1960's. By the end of the 1960's, the Thai Government began to shift away from its import-substitution strategy toward more export-oriented industries.

Tariff rates rose substantially in the 1970's, largely in response to severe current account deficits incurred in the wake of the oil price shocks in 1972 and 1979. The trade-weighted effective rate of protection on all goods is now about 30 percent, but rates are widely dispersed and strongly favor manufacturing over agriculture. The Thai Government recognizes that continued export growth and diversification are the key to sustained economic development and that the distortions created by the tariff structure may inhibit this growth. The government has begun to lower effective rates of protection on raw materials, intermediate products, and capital goods, and to reduce the dispersion among rates of protection.

Agricultural Trends and Policies

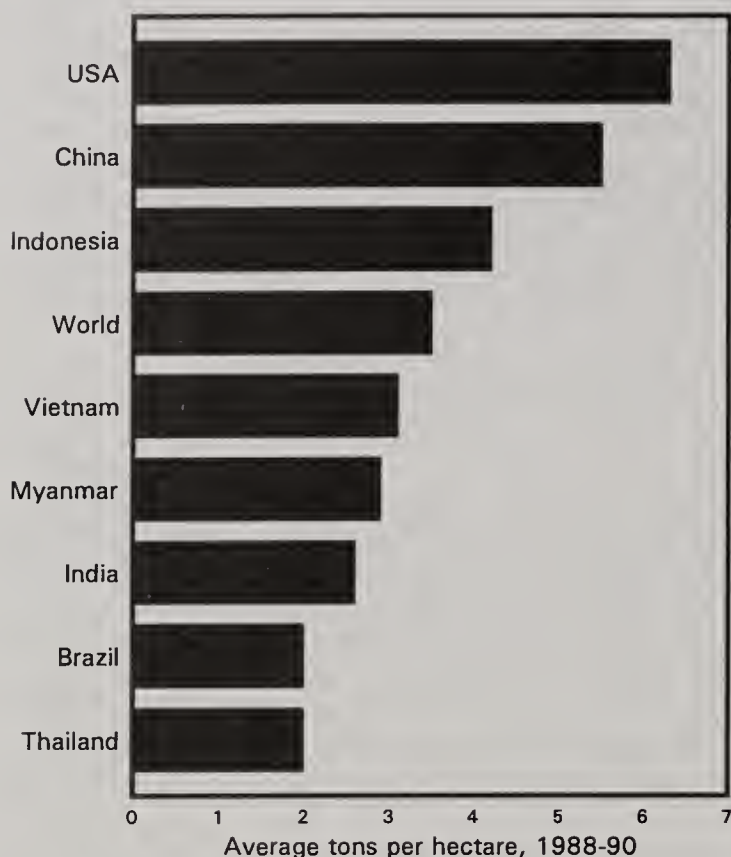
Thailand's agricultural sector differs in two important ways from its Southeast Asian neighbors. First, Thailand never fell under colonial rule and, consequently, did not develop large plantations for rubber and palm oil as in Malaysia, Indonesia, and other countries in the region. Rather, Thai agriculture has traditionally been characterized by small-scale, owner-operated subsistence and commercial farming. Second, Thailand has traditionally had a relatively abundant supply of cultivable land. Until the mid-1970's, most production increases came from expanding area under cultivation rather than from improved productivity, and yields for many crops remain well below those in other Southeast Asian countries. Like a number of its neighbors, Thailand provides little direct support to the agriculture sector beyond a few specific commodities and, in fact, has traditionally taxed agricultural exports, notably rice.

Rice Remains Thailand's Dominant Crop

Despite its declining relative importance in the Thai economy, rice remains the dominant crop and the mainstay of the Thai diet. About 60 percent of the cultivated land and 30 percent of the value of agricultural production are in rice (1990). Per capita rice consumption has declined somewhat in recent years to about 120 kilograms, but rice still accounts for about 25 percent of the average Thai food budget. Broken rice is used as a feed grain in Thailand, particularly in pork rations. Thailand is the world's largest rice exporter, supplying about one-third of the total world market in normal years.

Thailand produces several varieties of rice, and consumption varies by region. Glutinous rice is preferred in the upper Northeast, while fragrant rice is preferred in the lower North-

Figure M-1

Rice Yields of Major Producers

east. Ordinary indica rice is produced and consumed in the Central Plains. The Ministry of Agriculture has encouraged the production of fragrant and basmati rice for domestic consumption, but with limited success.

The government provides no-interest loans to producers of paddy rice of up to 90 percent of the value of established target prices and maintains buffer stocks to stabilize domestic prices. There are no direct subsidies on rice exports, and the export of paddy rice is prohibited. In 1990, about 45 percent of Thai rice exports consisted of low quality second-crop rice that competes with rice from Vietnam, Pakistan, and Burma. About 55 percent was high quality rice that competes with U.S. rice for markets in Europe and the Middle East.

Until the 1980's, most of the increase in rice production came through expanded acreage rather than increased yields. Fertilizer application rates remain among the lowest in Asia, and Thai rice yields are well below international standards (figure M-1). Thai rice production could increase substantially if rice prices increased and made more intensive use of fertilizers economically feasible. Expanded production is not expected in the near future, however, because the Ministry of Agriculture has been discouraging second-crop rice to conserve water and to control pest problems.

Thailand depends almost entirely on imports for its wheat and flour. Imports of wheat and flour average about 400,000 tons per year, of which about 45 percent typically comes from the United States. The government imposes a 40-percent ad valorem tariff on wheat and is trying, with little success, to expand domestic production but does not otherwise restrict

imports. Consumption of wheat-based foods is quite low, but is growing rapidly in urban areas due to increased incomes and availability of foreign foods. The Thai wheat market is expected to continue to grow as the diet diversifies.

Feed-Livestock Sector Expands

Livestock production is transforming Thai agriculture. In recent years Thailand has become a major producer and consumer of poultry, pork, and aquaculture products. In addition, poultry and prawn exports have increased rapidly. Poultry output expanded about 8 percent per year over the past decade in response to strong domestic and export demand. Thailand is the largest broiler exporter in Asia and the fourth largest in the world. Led by shipments to Japan, Thai broiler exports increased 18 percent in 1991 to 164,000 metric tons, following a 29-percent increase in 1990.

Pork and aquaculture production and consumption are also increasing rapidly, generating additional domestic demand for feedstuffs. Pork producers have benefited recently from some relaxing of restrictions on slaughterhouse operations. The increasing importance of livestock production is changing the role of Thailand in international feed markets and is forcing the government to liberalize its policies towards soybean production and imports.

Thailand has been a major exporter of feedstuffs, particularly corn and cassava, for the past two decades but expanding domestic feed demand and slowing production may see Thailand importing corn in the near future. Prior to 1986, about 70 percent of Thai corn production was exported, but by 1992 the share had fallen to less than 15 percent, or 500,000 tons.

Corn production appears to have leveled off and may decline in the near future. Most corn production occurs on unirrigated land in the drought-prone Upper Central Plain and the Lower Northern and Northeastern regions. Some farmers have switched from corn to more drought-resistant crops such as sorghum, beans, and cassava. In addition, restrictions on clearing forest lands for agricultural use have further reduced growth in corn area.

Corn area declined from a peak of 2.3 million hectares in 1985 to 1.32 million in 1991. Yields are highly dependent on rainfall, and have varied between 1.56 tons per hectare (1987/88) and 2.93 tons (1989/90) in recent years. The Ministry of Agriculture is promoting the use of high-yielding seed to expand and stabilize corn production, but less than 15 percent of the total area planted in 1991 was sown to high-yielding varieties.

The Ministry of Agriculture has attempted to encourage domestic soybean production for use in the domestic crushing and feed milling industries through the use of support prices and import licensing for soybeans and soyoil. A variable import surcharge on soymeal has been used to limit domestic price fluctuations.

Strong domestic feed demand drove up prices of several feedstuffs. Consequently, in late 1991 the government approved imports of 80,000 tons of soybeans, cut the soymeal

import surcharge almost in half, and temporarily reduced import tariffs on corn from 6 to 0.6 percent. Feedstuff prices continued to rise in 1992, raising concerns that production and exports of livestock products could be inhibited. The government is not likely to allow its restrictive import policies for soybeans to damage the growth of the lucrative poultry export market.

Issues Affecting Agricultural Trade in the 1990's

Thailand's agricultural trade in the 1990's is likely to be driven to a great extent by growth in per capita income, domestic agricultural policy, and the policies of major trading partners. Other related issues include development of the livestock and corresponding feed industries, increased pressures on the transportation infrastructure, and the availability of new agricultural land.

Income and Population Growth

Income growth plays a central role in determining Thai agricultural consumption and trade. As in other industrializing Asian nations, rising incomes are correlated with declines in per capita rice consumption offset by increases in wheat consumption. Equally important for Thailand, income growth stimulates meat and associated feed demand and will affect the direction and volume of Thai feed grain trade. These changes in turn increase pressure for reform of protein meal import policies and domestic livestock sector regulations.

For projections of Thai supply, demand, and trade, real GDP growth is assumed to fall from the average 9.9 percent rate achieved during the late 1980's to about 7 percent annually through the 1990's. The anticipated slowdown is attributable to growing infrastructural constraints and a reduction in the growth of major export markets and sources of foreign capital. Population growth is assumed to continue its decline from 1.4 percent in 1990 to 1.2 percent in 2000 due to rising incomes and continued success in family planning efforts. Implicit in the growth projections is the assumption that inflation will not be seriously aggravated by infrastructural constraints and remain at a relatively moderate 5-6 percent.

Domestic Agricultural Policy

The agricultural economy of Thailand operates relatively unencumbered by government intervention. Rice, the major crop produced and traded receives little government support. The sugar, soybean, and pork industries, however, are affected significantly by government policies. Support for sugar producers, put in place partially in response to intervention from other major producers and consumers, is assumed to remain unchanged through the projection period.

Soybean production has been supported as part of a quasi-import substitution policy to deter the growth in imports increasingly required to meet livestock sector demand. However, production has not risen sufficiently to meet domestic meal demand, causing protein feed prices to rise, and prompting the government to relax import restrictions. Liberalization of soy product markets is assumed to continue, implying a closer link between domestic and world prices. Nonethe-

less, soybean imports are expected to get moderate preferential treatment over meal imports in an effort to increase domestic value added through processing.

Under current law, hog slaughter is highly taxed and slaughterhouse ownership is tightly restricted. As a result, as much as 50 percent of hog production is slaughtered illegally in backyard operations. The development of modern pork production facilities has been constrained. In response to growing livestock demand, the government is assumed to deregulate the hog sector as part of an overall effort to rationalize livestock production and increase feed efficiency.

No significant changes are assumed in other agricultural production policies such as those concerning fertilizer and seed distribution, extension work, and investment in irrigation and transportation systems. These assumptions imply that growth in seed distribution, irrigation facilities, etc. will continue along historic trends.

Foreign Agricultural Policies

The European Community's Common Agricultural Policy (CAP) is assumed to undergo reforms that will bring EC feed prices closer to a world market level. As a result, the advantageous treatment now given Thai cassava exports to the EC is assumed to diminish through the projection period. In the past, the CAP increased the relative return to cassava production over competing crops such as dry season rice, corn, sorghum and, to some extent, soybeans. Under the assumption of CAP reform, relative returns to Thai cassava producers will decline.

The Multi-Fiber Agreement (MFA), which sets quotas on textile and clothing exports, is assumed to remain in effect through the projection period. The continued MFA quotas are expected to prevent Thai textile exports from sustaining the rapid growth of the 1980's. Thai textile exports are assumed to be increasingly constrained by the agreement. This assumption is, however, somewhat arbitrary because future quotas under the MFA are not known.

Agricultural Trade Prospects to 2000

The base projection results, incorporating the assumptions outlined above, are summarized in tables M-1 to M-3, and described below. These projections represent the most likely scenario through the year 2000. Following analysis of the base scenario results, the sensitivity of the projections to alternative assumptions on key variables is estimated and analyzed.

Food Grains

Growth in rice area is projected to increase moderately compared with the 1980's, but remain well below that achieved in the 1970's (table M-1). Continued slow growth is attributable largely to a decline in the availability of new land. However, some increases in area will occur as returns to soybean production decline under more liberalized trade regimes, and as returns to cassava production fall with changes in EC policies.

Table M-1. Thailand: Base projections for crops

				Growth rates	
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			

	-----Million tons-----			---Percent---	
Wheat					
Net imports	.20	.41	.84	7.3	7.4
Consumption	.20	.43	.84	8.0	7.0
Food	.20	.35	.66	5.9	6.5
Per cap.(Kg)	4.1	7.6	10.3	6.5	3.1
Feed	.00	.08	.18	**	8.7
Rice					
Area (Mil. ha)	8.99	9.60	10.49	.7	.9
Yield (Kg/ha)	1.25	1.32	1.43	.6	.8
Production	11.20	12.69	15.00	1.3	1.7
Net exports	3.12	4.18	6.23	2.9	4.1
Consumption	8.05	8.52	8.77	.6	.3
Food	8.05	8.52	8.77	.6	.3
Per cap.(Kg)	171.4	152.0	137.4	-1.2	-1.0
Corn					
Area (Mil. ha)	1.55	1.36	1.33	-1.3	-.2
Yield (Kg/ha)	2.34	2.82	3.07	1.9	.9
Production	3.62	3.83	4.09	.6	.7
Net imports	-2.52	-.97	.02	-9.1	**
Consumption	1.07	2.81	4.10	10.2	3.8
Food	.14	.05	.04	-10.1	-.8
Feed	.94	2.77	4.06	11.5	3.9
Per cap.(Kg)	22.8	50.2	64.2	8.2	2.5
Cotton					
Area (Mil. ha)	.14	.07	.08	-5.9	.4
Yield (Kg/ha)	.42	.46	.50	1.1	.8
Production	.06	.03	.04	-4.9	1.2
Net imports	.06	.31	.48	17.2	4.4
Consumption	.12	.33	.51	10.6	4.4
Per cap.(Kg)	2.6	5.9	7.5	8.7	2.4

** = Not applicable

Yield growth is expected to roughly follow its historic trend, with continued modest increases in fertilizer use and expansion of irrigation systems. Still, yields will remain low by international standards. Overall productivity growth will likely continue to be constrained by the uncertainty associated with frequent flooding and drought in unirrigated areas, a problem exacerbated by large-scale deforestation.

With these area and yield assumptions, output is projected to rise moderately into the next century, with exports reaching 6.2 million tons by 2000. Exportable surpluses will be bolstered by further declines in per capita consumption and slowing population growth. Per capita rice consumption is projected to decline approximately 10 percent by 2000.

Table M-2. Thailand: Base projections for livestock

				Growth rates	
	1979-	1989-	2000	-----	
	1981	1991		1980-90	1992-00
	avg.	avg.			
	-----Million tons-----			---Percent---	
Beef					
Production	.13	.17	.28	2.7	5.2
Net imports	.00	.00	.00	.0	.0
Consumption	.13	.17	.28	2.7	5.2
Per cap.(Kg)	2.7	3.1	4.4	1.4	3.6
Grain fed	.25	.34	.37	3.1	.9
Oilmeal fed	.08	.10	.11	2.4	.9
Pork					
Production	.37	.57	.85	4.5	4.0
Net imports	.00	.00	.00	.0	.0
Consumption	.37	.57	.85	4.5	4.0
Per cap.(Kg)	7.9	10.6	13.3	2.9	2.3
Grain fed	1.29	1.99	2.90	4.4	3.8
Oilmeal fed	.12	.18	.26	4.2	3.8
Poultry					
Production	.24	.51	1.12	7.7	8.2
Net exports	.02	.10	.30	15.5	11.8
Consumption	.22	.41	.82	6.5	7.2
Per cap.(Kg)	4.7	7.6	12.9	5.0	5.5
Grain fed	.43	.91	1.65	7.7	6.1
Oilmeal fed	.22	.46	.83	7.7	6.1

Source: USDA and Government of Thailand

The decline in per capita rice consumption is projected to be partially offset by increased wheat consumption. The change in the relative dietary importance of wheat is driven by changes in tastes associated with rising incomes and increased urbanization. Because Thailand produces no wheat, both consumption and imports are projected to rise to more than .8 million tons in 2000, roughly double the 1989-91 average.

Livestock and Feeds

Expanding incomes are forecast to drive continued rapid expansion of livestock production, though relative growth within the sector is expected to change somewhat (table M-2). While exports initially drove commercialization of the poultry sector, domestic use will continue to account for about 75 percent of production in 2000. Poultry exports are projected to expand nearly 12 percent per year, reaching 300,000 tons by 2000. Thailand is expected to remain the major supplier of Japan's poultry imports. However, exports to other markets, such as the EC, the Middle East, Singapore, and Hong Kong, will likely account for a growing share.

Pork production and consumption are forecast to increase 4 percent per year. Reduced slaughter taxation and higher producer returns are expected to eliminate most of the disincentives

Table M-3. Thailand: Base projections for oilseeds and products

	Growth rates				
	1979-1981 avg.	1989-1991 avg.	2000	1980-90	1992-00
	-----Million tons-----			---Percent---	
Oilseeds					
Area (Mil. ha)	.35	.94	.82	10.4	-1.3
Yield (Kg)	1.15	.95	1.16	-1.9	2.0
Production	.40	.89	.71	8.3	-2.2
Net exports	.05	.02	-.32	-6.5	**
Consumption	.36	.91	1.03	9.8	1.3
Crush	.22	.54	.63	9.4	1.6
Per cap.(Kg)	7.6	16.3	16.2	7.9	.0
Soybeans					
Area (Mil. ha)	.11	.43	.31	14.6	-3.2
Yield (Kg)	1.00	1.28	1.39	2.5	.8
Production	.11	.55	.43	17.5	-2.4
Net imports	.00	.03	.34	**	27.5
Consumption	.12	.58	.77	17.1	2.9
Crush	.07	.40	.57	19.0	3.6
Per cap.(Kg)	2.5	10.4	12.0	15.3	1.4
Oilmeals					
Production	.28	.76	.95	10.4	2.3
Net imports	.03	.52	.96	31.3	6.4
Consumption	.32	1.28	1.90	14.9	4.1
Yield (Kg/ha)	1.30	1.38	1.42	.6	.3
Soymeal					
Production	.05	.32	.44	20.4	3.2
Net imports	.15	.34	.65	8.5	6.7
Consumption	.14	.66	1.09	16.8	5.1
Oils					
Production	.08	.32	.44	15.5	3.1
Net imports	.04	.07	.22	5.8	12.1
Consumption	.11	.34	.66	11.7	7.0

** = Not applicable

tives for commercialization of the sector. Commercialization will also increase the likelihood that Thailand will move into pork export markets. Beef production, still tied to maintenance of the draught animal herd, is expected to grow about 5 percent per year.

Combined production of poultry, pork and beef is projected to grow about 6.1 percent annually in the 1990's, compared with 5.4 percent in the 1980's. The rapid growth assumes major changes in Thailand's feed grain and protein trade regimes. As recently as 1985, Thailand exported 3.7 million tons of corn. However, rapid growth in feed demand and

relatively slow increases in output imply that exports will fall and Thailand will become a small importer of corn during the 1990's.

Corn supply and demand. Corn area is projected to remain roughly constant at 1989-91 levels. The area projection is based, in part, on the assumption that the EC CAP reform process now underway will decrease Thai cassava prices and induce farmers to shift from cassava to corn production. The shift is expected to end the recent decline in corn area. Corn yield growth is expected to continue on its historic path, driven by increased use of high yielding variety seeds.

Lower prices will also make cassava more competitive with corn in domestic feed rations. As a result, corn consumption is projected to grow more slowly than overall grain feed demand, as domestic feeding of cassava expands. The availability of sorghum and low quality feed rice is also expected to continue to increase moderately. Despite increased use of cassava, sluggish growth in corn output and continued strong demand growth are projected to erode the corn surplus by 2000.

Oilmeal supply and demand. Thai protein feed supplies are derived primarily from soybean meal, fish meal, and rice bran. Domestic production of fish meal and rice bran is not projected to grow sufficiently to keep up with protein demand. The additional protein meal requirements of the livestock sector will be supplied primarily by soybean meal.

Soybean meal supplies are derived from domestic crushing of locally grown and imported beans, and from direct imports. On the domestic side, the area planted with soybeans is expected to decline as pressures to maintain more competitive domestic feed prices lead to lower import barriers and lower producer prices. Soybean yield growth is expected to follow recent trends, as government extension and seed distribution programs continue. With these assumptions, soybean production is projected to decline about 2 percent annually during the 1990's (table M-3).

Projected soybean meal demand and the soybean production outlook imply sustained high growth of soy product import demand in the 1990's. Demand will be met partly through meal imports and partly through imports of soybeans for domestic crushing. The government is expected to give preference to soybean imports over meal imports in order to increase domestic value added, and because of expanding demand for soybean oil in Thailand's tuna packing industry. However, inadequate crushing facilities are likely to hold soybean imports to less than one quarter of the required import demand for meals.

Cotton

Cotton production accounts for only 12 percent of mill consumption, and is projected to show little growth through 2000. Scope for efficient expansion of cotton production appears negligible. Cotton mill demand and raw cotton imports expanded rapidly in the 1980's, driven in large part by a growing textile export industry. During the 1990's, growth in mill demand and imports is expected to slow to about 4.4 percent

annually. The slowdown is expected because of the outlook for sluggish income growth in developed country textile markets, and for the continuation of quotas under the MFA. The continued existence of the MFA implies that Thai exports will begin to be constrained by import quotas. Currently, about half of Thai textile exports occur under MFA quotas.

Impact of Higher Income Growth

Income could grow faster than assumed in the base projections, given historic performance and the continued dynamism of Thailand and its neighbors. Higher growth could be spurred by many factors, including an easing of infrastructural constraints or faster expansion in manufacturing exports. To test the sensitivity of the base projections to higher income growth, the impacts of increasing income growth by 1 percentage point per year above the base assumption level were estimated (table M-4).

Increased income growth affects the Thai agricultural economy mainly by inducing higher consumption of grains and livestock products. The 1 percent increase in annual income growth boosts wheat imports 8 percent by the year 2000. The income elasticity of rice demand in Thailand, as in many other developing and newly industrialized Asian countries, is very low. As a result, the impact of faster growth on rice export supplies is negligible.

In the livestock sector, income growth increases consumption. Because Thailand is able to produce livestock domestically, faster growth in demand boosts livestock production and feed use. Total meat output increases more than 5 percent over the base scenario, leading to more than 6 percent increases in

Table M-4. Thailand: Results of high income scenario

	Base	High income	Change
	-----Million tons-----		Percent
Production			
Beef	.28	.29	3.6
Pork	.85	.89	4.4
Poultry	.82	.87	6.3
Consumption			
Corn	4.10	4.35	6.1
Soymeal	1.09	1.16	6.4
Net imports			
Wheat	.84	.90	7.5
Corn	.02	.27	1,225.0
Soy meal	.65	.72	10.2
Net exports			
Rice	6.23	6.20	-.4

Table M-5. Thailand: Trade impacts of changes in rice production

	Base	High area	High yield	High area and yield
Area (Mil. ha)	10.5	10.8	10.5	10.8
Yield (kg./ha)	1.4	1.4	1.5	1.5
Production (Mil. tons)	15.0	15.4	15.4	15.8
Exports (Mil. tons)	6.2	6.6	6.6	7.0

corn and soybean meal demand. The impact on feed trade by 2000 is a large increase in corn imports compared with the base projections, and a 10-percent increase in soybean meal imports.

Cotton imports are not directly affected, as they are tied primarily to the import demand for textiles in other nations.

Impact of Faster Growth in Rice Output

Thailand has been the world's largest rice exporter while maintaining the lowest yields of all major producers. In part, relatively low yields are attributable to relatively low government support for rice producers. From a technological standpoint, Thailand possesses considerable potential to increase rice production and trade. Significant increases could be induced in Thailand's market-oriented rice economy through changes in world prices, or through intervention to promote technology or to distort producer prices. Because of Thailand's role in world rice trade, alternative domestic supply developments could have a significant impact on world trade and prices.

Two scenarios, both of which are well within the technological constraints facing Thailand, demonstrate the impacts of alternative higher growth rates in rice output. In the first scenario, annual area growth is increased 0.25 percent above the base scenario and, in the second, annual yield growth is increased .25 percent. Although the increases implied by these scenarios are small, the impacts on rice exports by 2000 are significant (table M-5). Each alternative increases rice exports in 2000 by more than 6 percent over the base projection, and combined they boost rice exports almost 13 percent. These scenarios underscore the potential for increased Thai rice exports and the sensitivity of the base projections to small changes in assumptions.

Intervention in Soybean Markets

In the base scenario, the area devoted to soybeans declines steadily as government support for soybean production is eliminated. However, the government could choose to maintain support for domestic soybean production. Such a decision could stem from pressure to slow the growth of soybean and meal import costs, or to reduce or enhance incomes for domestic soybean producers.

Table M-6. Thailand: Results of soybean protection scenario

	Base	With protection	Change
	-----Million tons-----		Percent
Soybeans			
Net imports	.34	.24	-29

Future government intervention in soybean markets could take myriad forms. In the alternative scenario, it is assumed that sufficient input and non-price subsidies are provided to producers to maintain current area planted to soybeans. With this assumption, imports fall 29 percent below the base scenario in 2000 (table M-6). Other forms of feed sector intervention could cause greater distortions than those illustrated here. For example, import restrictions such as tariffs or quotas on soybean products would raise feed prices, affecting livestock production and the competitiveness of Thai poultry exporters.

Hog Slaughter Taxation

As the Thai economy has grown, consumers have increasingly supplemented their diets with meat products—particularly poultry and pork. The corresponding increase in domestic meat production has been a significant factor in the recent decline in Thai corn exports and rise in oilseed and meal imports. Still, past growth in feed demand could have been even greater without government restrictions that inhibit growth in the pork sector. In the base projections, it is assumed that existing taxes on hog slaughter will be reduced, permitting continued strong growth in pork output.

However, failure to remove the slaughter taxes could slow the development of the pork industry and reduce projected feed demand. The potential impact of continued slaughter taxes is evaluated in an alternate scenario that holds projected pork production constant at the 1990 level. This assumption is consistent with the slowdown in pork production that has

Table M-7. Thailand: Results of swine scenario

	Base	Controlled production	Change
	-----Million tons-----		Percent
Net imports			
Corn	.02	-.72	-3700
Soy meal	.65	.58	-10

occurred since the mid-1980's in the presence of taxation. The impact is a sharp reduction in projected grain feed demand in 2000, leaving Thailand as a significant corn exporter (table M-7).

Conclusions

Thailand's economy will probably continue to develop rapidly in the 1990's, as the government seeks to spread Bangkok's economic success to the rest of the country. Agriculture will remain an important segment of the economy, in terms of its contribution to GDP and exports, and as a source of employment and income for the large rural population. Nevertheless, the economy will continue to diversify away from agriculture, and the agriculture sector itself will continue to diversify. Consumption patterns are likely to shift as incomes rise, with rice decreasing in importance relative to wheat-based foods and livestock products. Livestock feed demand will continue to grow, with imports providing an increasing share of total supply.

Thailand is projected to shift from self-sufficiency or surplus positions in corn and soybeans to being an importer of both commodities. Recent declines in Thai corn exports were caused by growth in domestic livestock production and decreases in planted area as producers shifted land to other crops. At the same time, restrictive import policies toward soybeans contributed to rising feed prices.

Livestock sector growth at rates higher than assumed here would probably require the government to further liberalize soybean imports and to allow increasing corn imports. It is unlikely that the government would allow protectionist policies toward soybeans to inhibit the nascent but highly lucrative livestock industries. For the United States, changes in Thai corn trade may mean new export opportunities in markets once held by Thailand or, perhaps, in Thailand itself. Thailand will also become a growing market for soybeans and soybean meal, but U.S. penetration of Thai soybean product markets has, so far, been very limited.

Two factors that could alter this outlook for Thai feedstuffs trade include changes in foreign demand for livestock products and in EC policies affecting cassava imports. Successful resolution of the Uruguay Round of GATT negotiations would help ensure continued access of Thai poultry and prawn exports to major markets and would spur Thai demand for feedstuffs. Any disruption in the global trading system, on the other hand, could inhibit growth of Thai livestock-product exports and feedstuffs imports. Further, CAP reform could reduce cassava prices more sharply than assumed in these projections. In this event, Thailand would feed more cassava domestically and switch additional cassava land into corn production. Both actions would delay the date when Thailand becomes a consistent corn importer.

Thailand is projected to remain a large rice exporter through the end of the decade. Thai rice yields and rates of fertilizer use are far below world averages, suggesting there is considerable potential for increased production and exports. While

most Thai rice exports do not compete directly with higher quality U.S. rice, Thai exporters have begun orienting sales towards higher quality markets because of more competition from Vietnam in low-end markets in recent years. As a result, U.S. and Thai rice may compete more directly in the future.

Thailand's rapidly changing diet may offer a number of opportunities for U.S. exporters. A small, but rapidly growing market already exists for high-value processed foods, though it is still limited largely to the Bangkok area. Demand for wheat-based and other processed products is expected to increase rapidly as incomes grow and the population becomes more urbanized and accustomed to western-style foods. Finally, U.S. cotton exports to Thailand are likely to remain

strong through the end of the decade, although this may be increasingly dependent on the policy climate for Thai textile exports. If the MFA quotas begin to constrain textile exports, future cotton import demand will slow also.

The Thai agricultural sector is almost fully integrated into the global economy. Thailand's farmers and traders respond to world prices and to the trade and agricultural policies of their trading partners. The government remains intent on pursuing broad-based economic development strongly oriented toward the private sector. The government and the farm sector will continue to adapt to the international policy environment and global market forces, as they have since the signing of the Bowring Treaty almost one and half centuries ago.

Vietnam

Carol Levin and Mark Giordano

Abstract: Vietnam has taken large strides toward a market economy, leading to rapid growth in rice exports. The path and impact of future reforms are unclear, but area constraints and rising demand may prevent further growth in rice exports.

Keywords: Vietnam, agriculture, economic reforms, trade, rice.

Introduction

Vietnam is the largest and most dynamic of the three Indo-chinese nations. It is a country remembered most for decades of war and destruction and has, until recently, existed in the shadows of its prosperous Asian neighbors. However, beginning in the mid-1980's, a series of political, economic, and legal reforms were implemented which altered the economy's direction and promoted rapid increases in trade and investment. The reform process had a dramatic impact on rice output and trade, and by 1989 Vietnam had emerged as the world's third largest rice exporter—following Thailand and the United States.

While the outcome of the Vietnamese reform process is far from certain, some optimists already hail the country, with its strong natural-resource base, well-educated labor force, and the pre-communist entrepreneurial spirit of its southern provinces, as the next Asian Tiger. Still, Vietnam faces formidable challenges in the near future. A large fiscal deficit, high debt, growing unemployment, inflationary pressures, and evidence of increasing malnutrition could undermine recent economic progress. In the 1990's, Vietnam's role in agricultural trade will be largely dependent on the reform process and the ability of the government to overcome its current problems.

Economic Policies and Trends

Vietnam's initial attempts to transform from a centrally planned to a market-based economy were met with limited success. Initial reforms were instituted in the early 1980's, later followed by the *Doi Moi*, or renovation policies, of 1986 which attempted to shift the country more fully toward market economy. However, by late 1988 an economic crisis, intensified by a sharp reduction in Soviet assistance, prompted a further round of reforms.

In early 1989, the most integrated package of monetary, price, and exchange-rate reforms to date was implemented (table N-1). The thrust of the reforms was to decontrol prices and stabilize the economy. Measures included restructuring credit arrangements from negative to positive real-interest rates, a massive exchange rate devaluation, the elimination of consumer subsidies, and price and institutional reforms decentralizing and liberalizing the market. Price controls on most goods and services were abolished, a new land law was put

into effect, and as part of trade liberalization efforts, State trading companies were stripped of their monopoly control of imports and exports.

The immediate effects were profound. Inflation subsided; households shifted part of their assets out of gold and dollars back into the domestic currency, the dong; shortages of goods disappeared; and real growth peaked at 8 percent. Although exports to non-convertible currency areas (the former Soviet Union and Eastern Europe) had fallen by over 90 percent, the loss was more than compensated by increased trade with hard-currency countries such as Singapore, Japan, Hong Kong, and Taiwan.

Despite recent successes, the Vietnamese economy still faces significant challenges in the 1990's. The banking system is not yet capable of meeting the demands of a market economy, credit constraints hamper private enterprises, and an increasing budget deficit and large debt burden threaten the positive effects of the reforms. In the international sphere, lack of access to international financial and product markets caused by war-related embargoes has constrained growth. Despite recent softening of sanctions by the United States and Japan, future growth will remain hindered without closer ties to multilateral lending agencies and access to important markets such as the United States.

Agricultural Trends and Policies

The agricultural economy, consuming 72 percent of the labor force, provides 51 percent of GDP and 35-40 percent of total export value. Vietnam's main agricultural activities are centered in the Red River Delta in the North and the Mekong Delta in the South, which together account for 58 percent of staple grain production and approximately 45 percent of the country's population. Rice is the single most important crop, contributing over 60 percent of average daily caloric intake and providing farmers with a large share of household income. Approximately 50 percent of all rice is produced in the Mekong Delta, and 20 percent is produced in the Red River Delta. Most rice production is Indica varieties, though Japonica is grown in northern Vietnam. Sweet potatoes, corn, and cassava are other important agricultural commodities.

Table N-1. Vietnam: Summary of policy reforms since 1980

Policy	Year	Reform
Monetary	1989	- Interest rate restructured - Liberalization of exchange rate; Exchange rate determined by market
Fiscal	1989	- Elimination of consumer subsidies to State employees and military - Introduction of revenue elastic taxes (i.e. personal income tax)
Financial	1988	- Liberalization and decentralization of banking system Reorganization of banks from state control to four commercial banks for agriculture, industry and commerce, construction and investment, and foreign trade
	1990	- Legislation to tighten regulation of the financial system
Price	1989	- Price controls on most goods and services abolished, exceptions are fuel, electricity, water, and postage and telecommunications tariffs
Agricultural	1981-87	- Decollectivization; contract system established
	1988	- Family restored as basic economic unit - New land law grants user rights to households for periods up to 15 years for agricultural land and rights to inter-generational transfers - Output markets privatized, input supplies decentralized, and individuals given greater decision-making power for household resource allocation and crop choice
Trade	1987	- New Foreign Investment Law
	1989	- New tariff schedule, quota reduction on imports and exports - Reduction of monopoly control of state trading companies, provincial and local authorities allowed to establish trading companies - All enterprises, whether private or State owned, granted direct access to foreign markets
	1991	- Establishment of preferential tax and financial measures to encourage export production

Policy Change Affects Rice Production

Post-war rice production in Vietnam may be categorized by the country's three stages of agrarian reform; collectivisation (1976-1981), the contract system (1982-1987), and the transition to family farming (1988-1992). Following land reforms, the collectivization of Vietnamese agriculture, modeled on the Soviet and Chinese systems, began in 1959 in North Vietnam and 1975 in South Vietnam. Though 97 percent of northern farmers were collectivized, the process in the south was met with limited success, with only 42 percent of southern farmers organized in collectives by 1986 (6).

The differences between northern and southern agriculture have been attributed to different land use and allocation patterns, greater adoption of modern rice technology by southern farmers, and a stronger private enterprise economy in the South prior to 1975 (6). Attempts to collectivize the South reduced southern rice output between 1976 and 1981, and by the late 1970's productivity had stagnated in both the North and South.

Because of problems under the collectivized system, additional reforms were implemented beginning in 1980. Production was taken from direct State control to a contract system similar to what then existed in Southern China. Under the new system, farmers entered into contracts to deliver specified amounts of agricultural products to cooperatives, with all additional production kept for home consumption or sold to private traders. The contract system accelerated the growth in rice output substantially over the period of collectivization, mostly through higher yields (table N-2).

Though the contract system was successful in boosting production, there were barriers to efficiency that inhibited further growth. In 1988, many of these impediments were effectively removed when additional reforms liberalized the rice sector. Output markets were privatized, input supplies became more decentralized, and individuals were given greater decision-making power for household resource allocation and crop choice. In addition, households were given long-term leases on their land with the right to inter-generational transfers, which increased incentives for long-term investments to raise productivity.

Table N-2. Vietnam: Rice production performance.

Time period	1976-1981	1982-1987	1988-1992
Annual percent growth			
Area	1.14	.08	2.09
Yield	.82	2.73	2.83
Production	1.91	2.81	4.92
Population/1	2.60	2.60	2.00

Source: (6)

1/ Statistical Data of the Socialist Republic of Vietnam, 1986-1991.

By 1989, these new reforms had increased production and contributed to the country's sudden prominence in international rice markets. However, other factors also contributed to the increase in Vietnamese rice exports. These included the abolition of subsidized rice sales to government employees, an end to the monetization of rice with the decline of inflation and advent of positive real interest rates, a currency devaluation that increased Vietnam's competitiveness in international markets, and the initial release of farm-level stocks acquired under the old system.

While the policies since 1988 should continue to increase incentives to produce and export rice, the large boost in exports they initially provided is not likely to reoccur. Vietnam's role in rice trade in the 1990's will likely be more dependent on marginal changes in output and consumption, tied more to general economic performance and further rationalization of economic activity, than on changes in economic structure.

Issues Affecting Agriculture and Trade in the 1990's

Vietnam's most recent round of economic reforms has gone beyond past changes both in scope and magnitude. The country's maintenance of strong rice output growth and significant exports has defied earlier expectations. Key issues in evaluating prospects for growth in rice production and trade in the 1990's are the nature of future policies affecting producers, consumers, and trade, as well as prospects for growth in the Vietnamese economy and in export markets.

Policy Change

Policy reform has been fundamental to recent gains in both rice output and exports, and additional growth will depend in part on the direction and extent of future reforms. Rice output in the 1990's could be further boosted if measures are adopted to overcome remaining impediments to production and marketing efficiency. In the past, domestic policy reforms led to improved production through increased fertilizer use, greater use of modern high-yielding variety seeds, and more investment in irrigation. As a result, yield growth outpaced area expansion in the last decade, a trend likely to continue as land

availability and multiple cropping potential decline. However, additional use of modern high-yielding varieties can produce only marginal gains in output unless there is significant investment in water management; soil conservation; and research to overcome problems such as soil salinity, acidity, and erosion.

In addition, a lack of well-developed markets for inputs, outputs, and labor inhibit efficient production. For instance, though domestic agricultural output markets operate relatively freely, State companies continue to control a large share of the wholesale trade in agricultural inputs, and the government still provides subsidized inputs, cheap credit, and tax breaks to the State agricultural sector at the expense of private farmers. In addition, State control of credit and currency has limited the capital available to traders and food processors, thus hindering their ability to purchase rice and other commodities.

Further reform of the price and marketing structure for traded agricultural inputs and outputs, liberalization of the credit system, and the provision of enforceable property rights could help provide the necessary incentives for the farmers to further boost production. In the base scenario, it is assumed that the reform program to date is maintained, economic expansion continues at a moderate rate, and government fiscal problems persist.

Consumer Policies

A key issue in the outlook for Vietnam's rice sector in the 1990's is the relationship between rice exports and domestic consumption, i.e. the degree to which rice exports are competing with national food availability. Despite exportable surpluses of rice, regional shortages exist within the country that could become increasingly severe.

While average per-capita rice consumption grew steadily through the 1980's, malnutrition is prevalent in some regions because of poor distribution systems, growing unemployment, and insufficient incomes, all of which restrict demand. Regional shortages are worsened by both poor marketing and a transportation infrastructure that inhibits movement of grain to deficit areas and dampens price incentives in surplus regions. To partially address these problems, the government may be pressured to intervene to restrict rice exports and redistribute rice from surplus to deficit areas.

Still, major cutbacks in rice exports to enhance domestic consumption are not likely in the near future. Although other countries in the region have pursued such policies, they are less dependent on rice export revenues than Vietnam is now. Significant controls on rice exports are unlikely, at least until exports of other goods, particularly oil, grow and the economy expands. It is assumed that the government will not significantly curtail rice exports in the base scenario.

Income Growth

In addition to its impact on productivity, income growth is important to the rice economy through its role in consumption decisions. Vietnam's per capita rice consumption is already

However, little empirical work has been done in Vietnam to provide a reasonable range of income elasticities regarding rice consumption, generating a key point of uncertainty in projections. Uncertainty is also caused by the instability of the Vietnamese economy and the uncertain outcome of reforms, making projections of future income growth difficult. In the base scenario, real income growth is assumed to be 6.5 percent annually. This rate, slightly lower than that achieved immediately following the most recent reforms, was assumed because most of the one-time benefits attributable to the reform process had already accrued. A relatively low income elasticity is assumed because of the current high per capita consumption, and because continued economic expansion should increase the supply of products for diet diversity.

Agricultural and Trade Prospects to 2000

Predictions concerning the future of Vietnam's rice sector are particularly difficult, given the ongoing reforms, poor data on the agricultural economy, and uncertainty regarding Vietnam's integration into the world economy. Therefore, after establishing a base scenario, the analysis will try to establish some limits to potential variability in the rice economy by evaluating two other scenarios.

Because of the current difficulty in determining parameters, those applied here are based on analyses of other Asian developing nations and do not reflect precise estimates. A theoretic restriction was imposed on consumption function parameters forcing the sum of the income, own price, and cross price elasticities to equal zero. The projections reflect neither stock changes nor the impact of government intervention in rice exports on yearly trade fluctuations.

Base Scenario

Based on the assumptions outlined above, strong rice-yield growth is expected to continue as investment is encouraged by long-term land-tenure arrangements and more efficient

Table N-3. Vietnam: Base projections for rice

	1979-1981 avg.	1989-1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Rice					
Area (Mil. ha)	5.56	6.17	6.45	1.1	.4
Yield (Kg/ha)	1.40	2.11	2.67	4.2	2.4
Production	7.77	13.02	17.25	5.3	2.9
Net exports	-.11	1.43	2.00	N/A	3.4
Consumption	7.87	11.59	15.20	3.9	2.8
Per cap.(Kg)	147	176	189.00	1.8	.7

Table N-4. Vietnam: Scenario assumptions

	Low	Base	High
Income growth (%)	4.50	6.50	8.50
Population growth (%)	2.00	2.00	2.00
Area growth (%)	.25	.50	.75
Yield growth (%)	1.15	1.90	2.65
Consumer price (%)	1.00	.00	-1.50
Income elasticity	.40	.25	.10
Own price elasticity	-.60	-.50	-.40

marketing systems. However, area expansion is expected to moderate as new land availability becomes increasingly limited. As a result, rice production is projected to expand at an average annual rate of 2.9 percent, slightly higher than expected population growth (table N-3).

Per capita rice consumption is expected to rise only moderately from 1991 levels, resulting in consumption growth approximating overall population expansion. Together, the production and consumption projections imply annual rice exports through 2000 of 2 million tons, or slightly higher than that achieved in 1991.

Alternative Scenarios

The two alternative scenarios presented here incorporate income growth assumptions different from those assumed in the base scenario. We assume an interrelationship between income growth, market reform, and consumption patterns. As a result, in the scenarios, alternative income growth assumptions are accompanied by alternate assumptions regarding changes in prices and supply and demand parameters (table N-4).

In the high scenario, market reforms in addition to those of the base scenario are assumed to be implemented, resulting in greater production and marketing efficiencies and a 2 percent increase in income growth over the base scenario. In this scenario, rice prices are assumed to decline in line with world levels as domestic markets become more open. Despite reduced prices, more efficiency in input and output markets

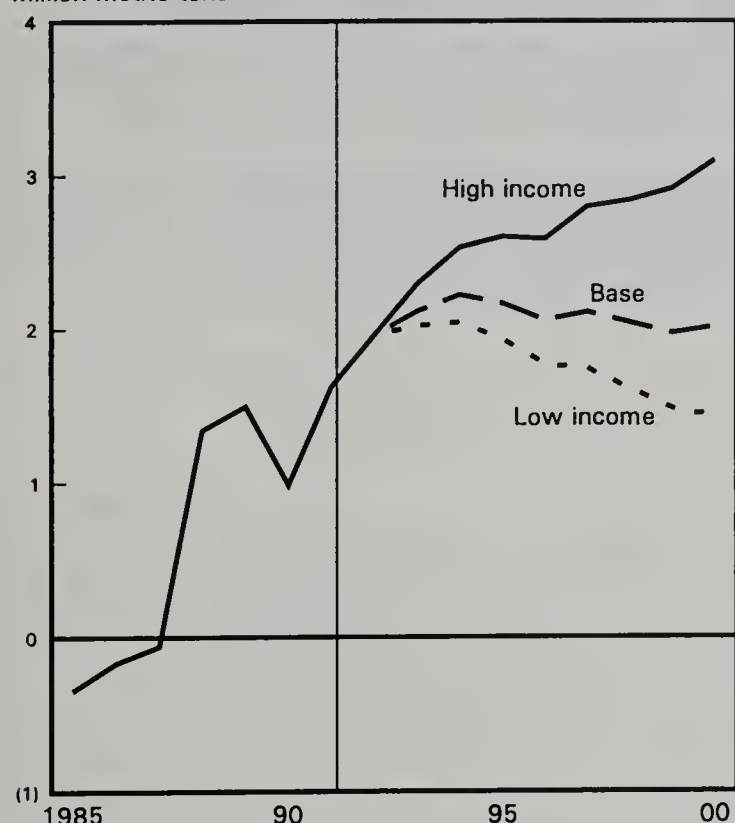
Table N-5. Vietnam: Scenario results

	Low	Base	High
	Million tons		
Production	15.9	17.3	18.7
Consumption	14.5	15.2	15.6
Per capita (Kg.)	179.8	189.0	193.1
Exports	1.4	2.0	3.1

Figure N-1

Vietnam: Rice Export Scenarios

Million metric tons



Source: USDA

boosts production above the base scenario as farm productivity and profitability rise.

Lower prices and higher incomes increase rice consumption. However, the increase in rice demand is dampened because rising wealth is expected to decrease the responsiveness of rice consumption to both income and price changes. Therefore, consumption is expected to rise 2.6 percent above the base scenario, while exports increase more than 50 percent to about 3.1 million tons (table N-5).

In the low scenario, income growth is assumed to be 2 percent below that in the base scenario. The decrease could be caused by a retrenchment in reforms, or more likely, by problems with the government deficit or in controlling the money supply, thereby decreasing economic stability. The added uncertainty is assumed to decrease production incentives and profitability, causing a decrease in rice output growth from base scenario levels and leading to rising consumer prices. The impact of lower income growth on consumption decisions is expected to be the reverse of that in the "High" scenario, with consumer sensitivity to both prices and incomes increasing. The combined effect is a fall in both total and per capita consumption from base levels. Despite this, production growth is insufficient to maintain exports, which fall nearly 30 percent below the base scenario (figure N-1).

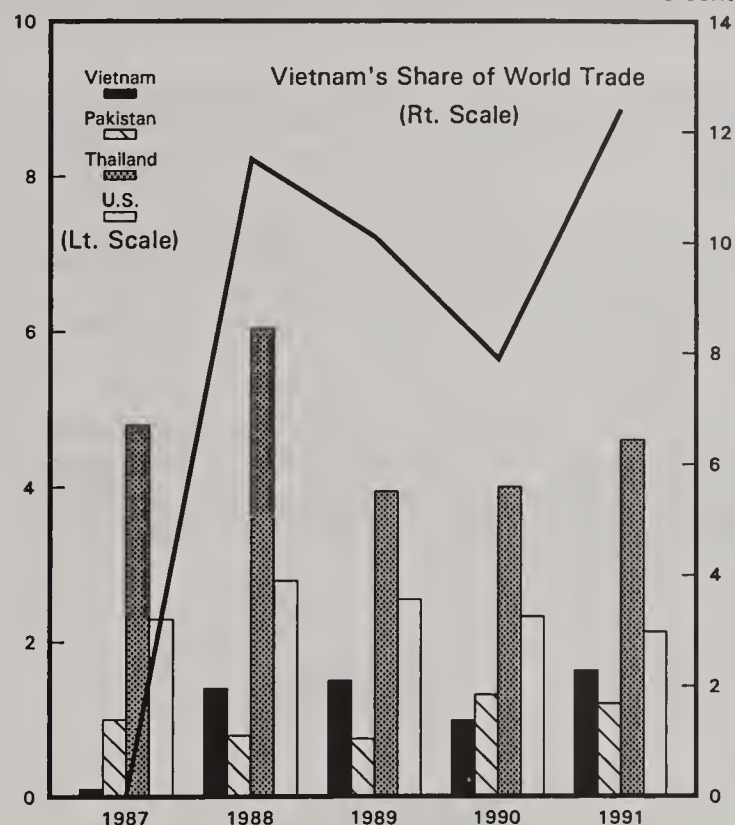
Conclusions

Vietnam has made impressive strides in moving toward a market economy, resulting in its emergence as one of the world's largest rice exporters. However, it is still far from

Figure N-2

Rice Exports, Selected Major Traders

Million tons



clear how the reform process will finally play itself out, for the agricultural sector or the economy as a whole. Even in the scenarios presented here, based on moderate changes in key assumptions, projections of rice export growth in the 1990's ranged from strongly positive to moderately negative. Much larger variations could be expected if more radical economic or political events took place.

The potential for fluctuations in Vietnam's rice economy poses a key point of uncertainty in future world rice trade. Unlike wheat, rice is traded in relatively thin markets where only 5 percent of world production is exported. As shown in figure N-2, the recent rise in rice exports from Vietnam has already made the country a significant player in world markets, and as a result, even modest changes in Vietnamese trade could have a major impact on the world rice market.

Until there is a change in diplomatic and trade status, Vietnam's relationship with U.S. agriculture will likely be primarily as a competitor in world rice markets. Until recently, competition has been limited by market differentiation resulting from quality differentials. However, Vietnamese trade in high-quality rice capable of competing with U.S. exports has grown rapidly, reaching nearly 20 percent of total exports in 1992. If trade relations between the United States and Vietnam are liberalized, some potential would exist for U.S. exports of wheat, feeds, and animal products. However, because Vietnam is still at an early stage of economic development, opportunities will remain limited in the 1990's.

References

1. Beresford, M. "Vietnam: Socialist Agriculture in Transition," *Journal of Contemporary Asia*, Vol. 20(4), 1990
2. Banister, J. "Vietnam Population Dynamics and Prospects," CIR Staff Paper, No. 65, Center for International Research, U.S. Bureau of the Census, Washington D.C., 1992.
3. Dollar, D. "Vietnam: Successes and Failures of Macroeconomic Stabilization," in *The Challenge of Reform in Indochina*, ed. by B. Ljuggren, Harvard University Press, Cambridge, 1993.
4. Gates, C.L. and D. Truong. "Reform of a Centrally-Managed Developing Economy: the Vietnamese Perspective," Nordic Institute of Asian Studies, Report No. 9, Copenhagen, 1992.
5. Leipziger, D.M. "Awakening the Market: Vietnam's Economic Transition," World Bank Discussion Papers, No. 157, Washington D.C., 1992.
6. Pingali, P. and Vo-Tong Xuan. "Vietnam Decollectivization and Rice Productivity Growth," *Economic Development and Cultural Change*, Vol 40(4), July 1992.
7. Xuan, V.-T., "The Challenges of Agricultural Development in Vietnam," paper presented at Conference on the Challenges of Vietnam's Reconstruction, May 21-22, 1992, Washington D.C., Mimeograph.

Asian Agricultural Trade Prospects in the 1990's

Rip Landes and Mark Giordano

Abstract: Asian agricultural imports are projected to remain strong in the 1990's. Expected trends include rising demand for value-added products in East Asia, more growth in bulk commodity imports in South and Southeast Asia, and shrinking exports by China. Growing Asian markets will present both opportunities and challenges for U.S. exporters.

Keywords: Asia, agriculture, trade, projections, wheat, rice, coarse grains, soybeans and meal, vegetable oil, meats, cotton, market shares.

Introduction

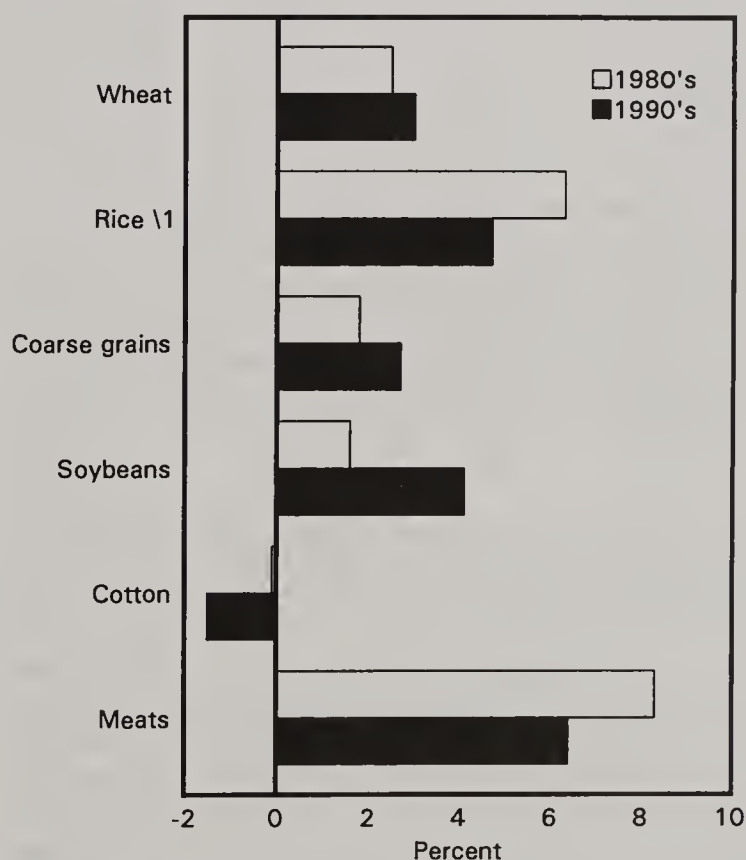
Asia is projected to maintain strong growth in import demand for major agricultural products in the 1990's. East Asian markets, where growing imports of high-value products will offset slowing demand for bulk commodities, will continue to account for the bulk of Asian farm imports. However, the fastest growth in farm imports, primarily bulk commodities, will occur in the rapidly developing economies of Southeast and South Asia. Although China's farm exports are forecast to rise in the near term, declining exportable surpluses in China are likely to increase export opportunities in Asia for the United States and other suppliers by the late 1990's. The future of China's agriculture is highly uncertain, and rising demand could boost growth in Asian imports for some commodities significantly higher than in the 1980's.

The Asian trade projections for 2000 are sensitive to assumptions on economic growth, consumer behavior, crop productivity, and both domestic and multilateral agricultural and trade policies. The projections do not account for the impacts of potential global or regional multilateral policy changes, including a yet-to-be completed agreement to reform agricultural policies under the auspices of the General Agreement on Tariffs and Trade (GATT). They do, however, incorporate the impact of anticipated unilateral policy changes. For the more developed East Asian markets, the future dynamics of consumer behavior and potential changes in farm policy offer the most uncertainty. Elsewhere in the region, prospects for economic growth and farm productivity gains are also important.

Asia was one of the few U.S. growth markets in the 1980's, and is now the largest regional market for U.S. farm commodities. Therefore, a growing Asian market will create significant potential for U.S. farm export gains in the 1990's. Meeting East Asian demand for meats and other high-value products will remain critical to U.S. interests. However, it will also be increasingly important for U.S. bulk commodities to maintain or raise market share in China and South and Southeast Asia.

Figure O-1

Asia: Growth Rates of Net Imports by Commodity



\1 Growth rate of net exports.

Commodity Trade Outlook

Strong gains are projected for Asia's net imports of most major farm commodities. For wheat, coarse grain, and soybeans and meal, net imports are projected to expand as fast or faster in the 1990's as in the 1980's (figure O-1). In the case of rice, Asia's net exports are projected to expand more slowly. For many commodities, particularly wheat, coarse grain, and soybeans and meal, expected developments in China are key to the outlook.

Food Grain Trade To Expand

Asian wheat imports are projected to grow faster in the 1990's than in the 1980's. Annual growth in wheat imports is projected at nearly 3 percent, boosting imports from 32 million

Table O-1. Asia: Food grain projections

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Wheat					
Area (Mil. ha)	58.9	63.1	65.7	.7	.4
Yield (Kg/ha)	1.8	2.6	3.1	3.7	1.8
Production	106.2	164.1	203.9	4.4	2.2
Imports	24.6	31.8	42.3	2.6	2.9
Exports	.2	.7	.5	15.5	-2.9
Consumption	130.8	195.0	244.2	4.1	2.3
Rice					
Area (Mil. ha)	123	126	130	.2	.3
Yield (Kg/ha)	2	3	3	2.5	.8
Production	243	319	355	2.7	1.1
Imports	4	2	2	-5.9	-.7
Exports	7	8	11	1.5	3.6
Consumption	242	313	345	2.6	1.0

Wheat includes: Bangladesh, China, India, Indonesia, Japan, Malaysia, Pakistan, The Philippines, South Korea, Taiwan and Thailand.

Rice includes: Bangladesh, China, India, Indonesia, Hong Kong, Japan, Malaysia, Myanmar, Pakistan, The Philippines, South Korea, Taiwan, Thailand and Vietnam.

tons in 1989-91 to more than 42 million by 2000 (table O-1). All the growth in wheat demand is projected to occur in China and South and Southeast Asia (figure O-2).

Slower projected growth in Asia's net exports of rice in the 1990's is the result of somewhat faster growth in Asian exports, principally to markets outside the region, combined with a slower decline in Asian imports (table O-1; figure O-3). Many major rice producers have significant scope to raise productivity via existing technology and with the right incentives. At the same time, a growing preference for wheat-based foods should continue to slow rice demand in much of the region.

- While rice demand falls, food demand for wheat is projected to slow in Japan and the NIC's, which now account for most Asian wheat imports. Incomes are expected to grow more slowly than in the 1980's, and the region's relatively high-income consumers will continue to diversify their diets away from food staples. Although farm restructuring and declining support is expected to gradually reduce rice production, a liberalization of rice trade that would boost imports is unlikely in the absence of multi-lateral reform.

Figure O-2

Asia: Net Imports of Wheat by Subregion

Million tons

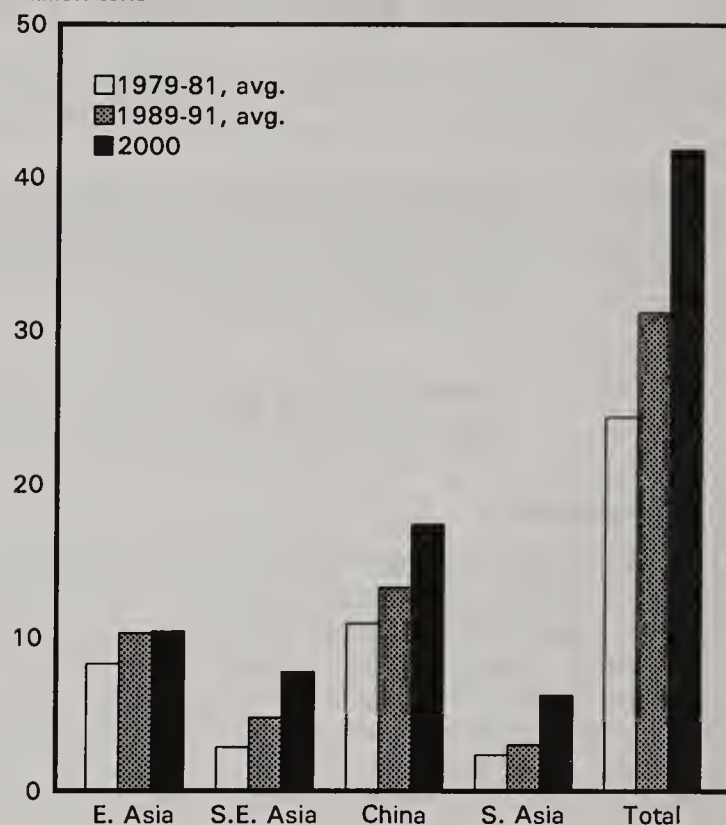
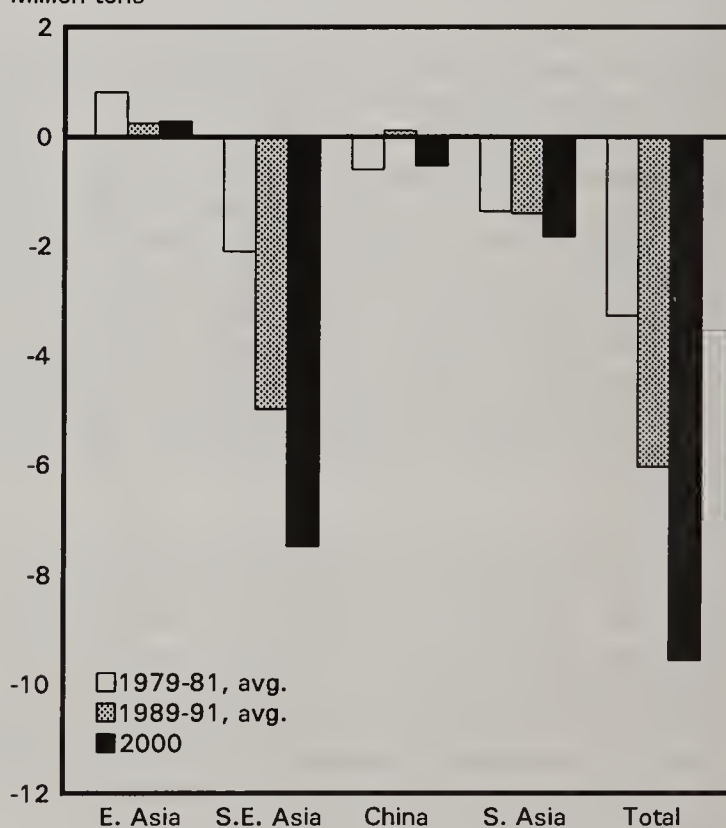


Figure O-3

Asia: Net Imports of Rice by Subregion

Million tons



Note: Negative numbers denote net exports.

- Wheat import demand is projected to be strong in Southeast Asia, where wheat is not produced and incomes are growing rapidly. Wheat use continues to increase across the region while consumption of rice, the traditional food staple, is slowing. The region's rice exports, primarily by Thailand and Vietnam, are expected to slow somewhat compared with the 1980's, consistent with projected trends in global demand and prices. Yield gains are expected to permit Indonesia to sustain self-sufficiency, with Malaysia and the Philippines accounting for most of the region's rice imports.
- In China, Asia's largest wheat producer and consumer, growth in wheat demand is expected to outstrip supply in the 1990's. Imports are projected to grow 2.8 percent annually to 17.4 million tons by 2000, accounting for about 40 percent of all growth in Asian wheat imports. Scope for output growth is limited by constraints on area and on further gains in already high yields, while demand is likely to continue responding to rapid income growth. Demand for rice, however, is expected to slow because of current high use and diet diversification. Land is likely to be shifted out of rice cultivation, and trade is expected to remain small.
- Food grain trade prospects in South Asia are mixed. Indian wheat production is projected to keep pace with robust demand. However, wheat imports are expected to rise in Pakistan and Bangladesh, where there are more binding constraints on production. India is also projected to main-

tain self-sufficiency in short-staple rice because of productivity gains and slower growth in per capita demand. Rice exports, primarily of long-grain and aromatic varieties, by India and Pakistan are expected to strengthen.

Net Feed Import Demand To Strengthen

Asian coarse grain imports are projected to grow more slowly in the 1990's (table O-2). The impact of slower growth in feed use in Japan and the NIC's, which account for most Asian coarse grain imports, is expected to be only partially offset by rising feed demand in Southeast Asia (figure O-4). However, prospects for exports to Asia from outside the region are projected to improve because of shrinking exportable surpluses in China and Thailand. A key question is whether other Asian producers, such as Indonesia or India, will emerge as exporters.

Table O-2. Asia: Feed projections

	1979-1981 avg.	1989-1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Coarse grains					
Area (Mil. ha)	70.6	66.8	65.5	-.6	-.2
Yield (Kg/ha)	1.5	2.1	2.6	3.5	2.2
Production	103.0	140.1	160.6	3.1	1.4
Imports	27.2	35.2	43.5	2.6	2.1
Exports	2.6	5.9	5.2	8.3	-1.2
Consumption	129.7	163.7	199.0	2.4	2.0
Soybeans					
Area (Mil. ha)	9.2	12.1	13.9	2.8	1.4
Yield (Kg/ha)	1.1	1.3	1.4	2.1	.4
Production	9.9	14.8	19.4	4.1	2.8
Imports	6.9	8.7	11.8	2.3	3.1
Exports	.5	1.1	.4	9.1	-9.6
Consumption	15.7	22.4	30.1	3.6	3.0
Soymeal					
Production	5.6	10.4	14.5	6.5	3.4
Imports	.9	2.6	3.9	11.6	4.0
Exports	.3	3.0	2.8	25.8	-.8
Consumption	6.1	10.0	15.6	5.1	4.5

Coarse grain includes: China, India, Indonesia, Japan, Malaysia, Pakistan, South Korea, Taiwan, Thailand.

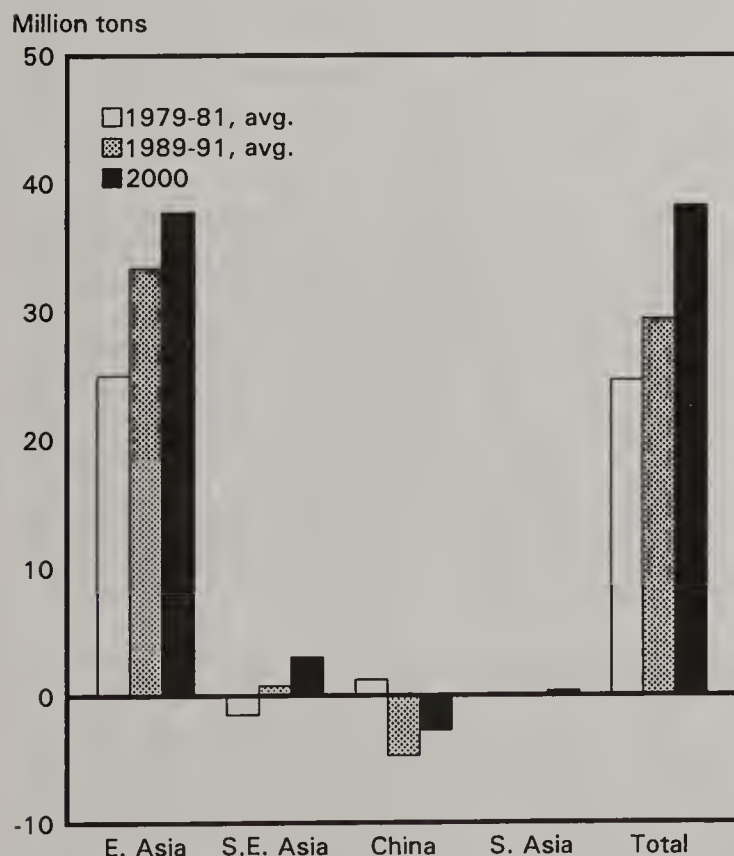
Note: Coarse grain figures for China, Pakistan, The Philippines and Thailand include corn only.

Soybeans include: China, India, Indonesia, Japan, Malaysia, Pakistan, The Philippines, South Korea, Taiwan and Thailand.

Soymeal includes: China, India, Indonesia, Japan, Malaysia, Pakistan, The Philippines, South Korea, Taiwan and Thailand.

Figure O-4

Asia: Net Imports of Coarse Grains by Subregion

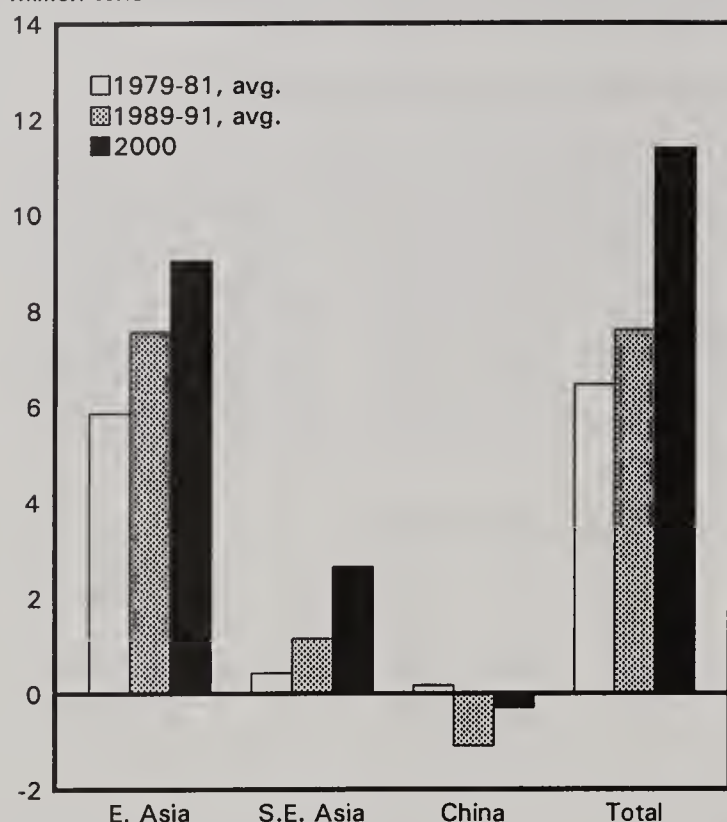


Note: Negative numbers denote net exports.

Figure O-5

Asia: Net Imports of Soybeans by Subregion

Million tons



Note: Negative numbers denote net exports.

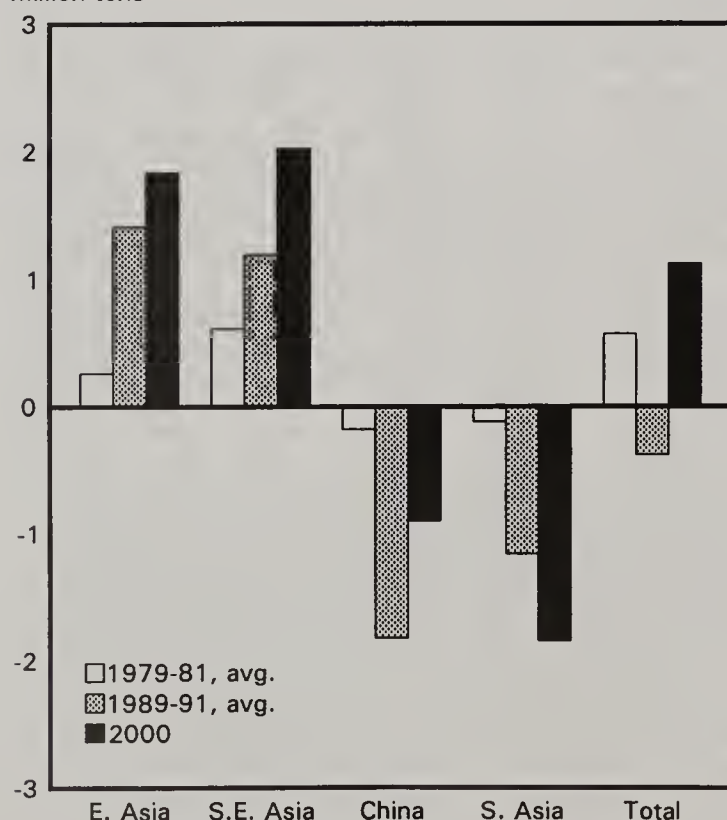
Demand for oilseeds and meals is projected to expand rapidly in the 1990's, driven by rising feed demand and limited capacity to produce high quality feed protein in most countries. As with coarse grain, slower demand growth in Japan and the NIC's will be countered by rising demand in Southeast Asia and declining exports by China (figures O-5 and O-6). Smaller Chinese exports of soybeans and meal will enhance prospects for exports to Asia from outside the region.

- Growth in feed grain and oilmeal demand in Japan and the NIC's is projected to continue to slow. Key factors are the outlook for reduced growth in meat demand due to slower income growth and high consumption relative to other Asian countries, and a continued shift towards imports of meat rather than livestock feed. Rapeseed and canola may further increase market share relative to soybeans if their higher oil content improves crushing returns.
- Feed grain and oilmeal demand is projected to expand rapidly in Southeast Asia, driven by expansion of incomes, meat demand, and livestock production. Thailand is expected to become a corn importer, as growth in feed use to meet both domestic and export demand for poultry and other meats outstrips domestic supply. However, Indonesia, with a large area planted to corn and low yields, is projected to become a corn exporter. Soybean meal imports will grow because the region has little capacity for efficient production of quality feed protein. Thai and Indonesian soybean output is projected to slow because of land constraints and policy steps to reduce protection.

Figure O-6

Asia: Net Imports of Soymeal by Subregion

Million tons



Note: Negative numbers denote net exports.

- China's exportable surpluses of corn, soybeans, and soybean meal are projected to fall by 2000. Rising incomes, marketing reforms, and reduced feed use of rice will sustain rapid growth in livestock output and feed demand. At the same time, prospects for expanding corn and soybean area or sustaining rapid yield growth are limited. An alternate scenario suggests that reforms could result in China being a significant net corn and soybean importer by 2000.
- South Asia's coarse grain imports are projected to rise, but the region is expected to remain a growing net exporter of oilmeals. Pakistan is projected to become a corn importer as feed demand outpaces limited production capacity. Feed grain imports by India, however, are unlikely because rising feed use is offset by declining food use. India also has substantial productive capacity and, with higher incentives, could emerge as a corn exporter. India's soybean meal exports are expected to maintain strong growth, and to compete with the United States and other suppliers in Asian markets. Pakistan's cottonseed meal surplus is expected to meet domestic meal demand.

East Asian Meat Imports To Rise

Asian demand for imported beef, pork, and poultry meat is projected to remain strong in the 1990's, after the lifting of trade barriers combined with rising incomes led to rapid growth of the 1980's (table O-3). Growth in Asian meat imports will continue to exceed growth in consumption. Developments in East Asia remain key to Asia's meat import demand. Rising demand elsewhere in the region is likely to

Table O-3. East Asia: Meat projections

	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates	
				----- 1980-90	1992-00
	-----Million tons-----			-----Percent-----	
Beef					
Production	.5	.7	.8	2.3	1.4
Imports	.3	.9	1.7	11.8	6.8
Exports	.0	**	.0	N/A	-100.0
Consumption	.8	1.6	2.5	6.9	4.8
Pork					
Production	2.2	3.2	3.6	3.6	1.3
Imports	.4	.8	1.2	6.9	5.0
Exports	**	.2	.2	25.1	-2.1
Consumption	2.6	3.7	4.6	3.7	2.2
Poultry					
Production	1.5	2.2	2.5	3.5	1.5
Imports	.2	.6	1.0	13.3	6.1
Exports	**	.1	.1	40.1	2.9
Consumption	1.7	2.7	3.4	4.6	2.6

Includes: Hong Kong, Japan, South Korea and Taiwan.

** = less than 50,000 tons

N/A = incalculable value

be matched by growth in domestic production. Taiwan's pork exports are expected to fall, but Thailand and other Southeast Asian countries could become increasingly competitive in the Asian pork and poultry markets.

- Developments in Japan and the NIC's, including growth in consumer meat demand and more liberal import policies, led to rapid growth in meat imports in the 1980's. The same factors are projected to sustain rapid growth in beef, pork, and poultry imports in the 1990's. Taiwan's exportable surplus of pork is projected to fall because of the environmental cost of intensive production.
- Rapid growth is projected in demand for beef, pork, and poultry meat in Southeast Asia, but demand is expected to be met by expanding domestic supplies. Thailand is expected to remain a highly competitive exporter of poultry meat, and other Southeast Asian countries, particularly Malaysia and Indonesia, could emerge as meat exporters.
- China is also projected to maintain rapid growth in meat demand, but demand is likely to be matched by gains in domestic production.

Vegetable Oil Import Demand Projected To Rise

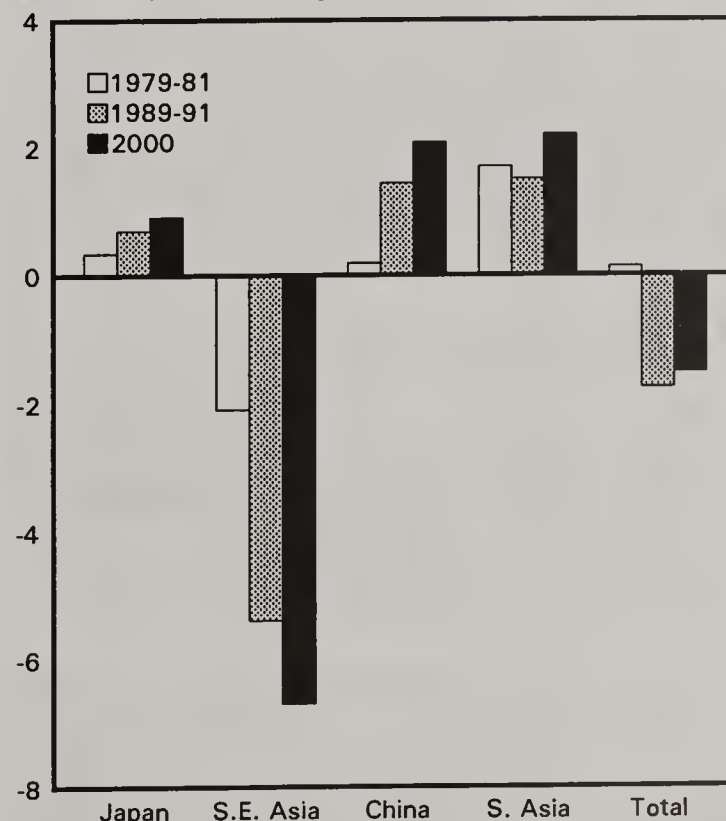
Asian imports of edible oils are projected to strengthen in the 1990's, based primarily on the outlook for faster growth in Indian imports and sustained growth in China and Pakistan (figure O-7). Consistent with expected global demand conditions, exportable surpluses of oil, primarily Southeast Asian palm oil, are projected to sustain strong growth in the 1990's, but not at the 1980's pace. Asian net exports of edible oil are expected to fall marginally.

- In Japan and the NIC's, edible oil demand is expected to slow, due to slower income growth and relatively high levels of use.
- China is projected to remain Asia's largest edible oil importer. Edible oil imports are expected to sustain strong growth because of rising demand and slower growth in domestic oilseed production.
- Southeast Asian exports of edible oil, mostly palm oil, are projected to slow somewhat in the 1990's due to weaker global demand and slowed plantings. Combined Malaysian and Indonesian palm oil export growth is projected to slow from 9.2 percent annually in the 1980's to about 4.5 percent in the 1990's.

Figure O-7

Asia: Net Imports of Edible Oil by Subregion

Million tons, annual average



Note: Negative numbers denote net exports.

- South Asian edible oil imports are projected to expand more rapidly in the 1990's, based on a resurgence in India's imports and further growth in Pakistan's imports. Palm oil is likely to maintain a dominant market share, based on price and preferred characteristics.

Cotton Import Demand Projected Stronger

Asia's textile industry now accounts for more than 60 percent of global consumption of raw cotton and exports of cotton fabric. Asian import demand for raw cotton grew only 1 percent per year in the 1980's, and is expected to show little or no growth in the 1990's (table O-4). Falling East Asian demand, stemming largely from the shift of textile processing to lower-cost regions, is projected to offset growth in textile processing and cotton imports in Southeast Asia (figure O-8). Prospects for cotton exports to Asia from outside the region may improve, however, because of limited exportable surpluses in China by 2000, and because most South Asian production is likely to be processed into textiles to meet rapidly expanding domestic and export demand.

Asian cotton imports in the 1990's will depend on growth in demand among textile importing nations, and on the extent to which Asian countries can maintain growth in textile exports under the Multi-Fiber Agreement (MFA). More liberal MFA quotas would spur demand among the emerging low-cost textile exporters in South and Southeast Asia, and China. More restrictive quotas, on the other hand, may tend to preserve higher-cost processing in East Asia, where cotton is increasingly imported in the form of yarns and cloth, rather than raw cotton.

- Raw cotton imports by Japan and the NIC's, which now accounts for 70 percent of Asian imports, slowed in the 1980's and is projected to fall in the 1990's. East Asian demand will shrink as textile processing shifts to lower-wage countries. Increasingly, cotton imports will be in the form of yarns, cloth, and finished products.

Table O-4. Asia: Cotton projections

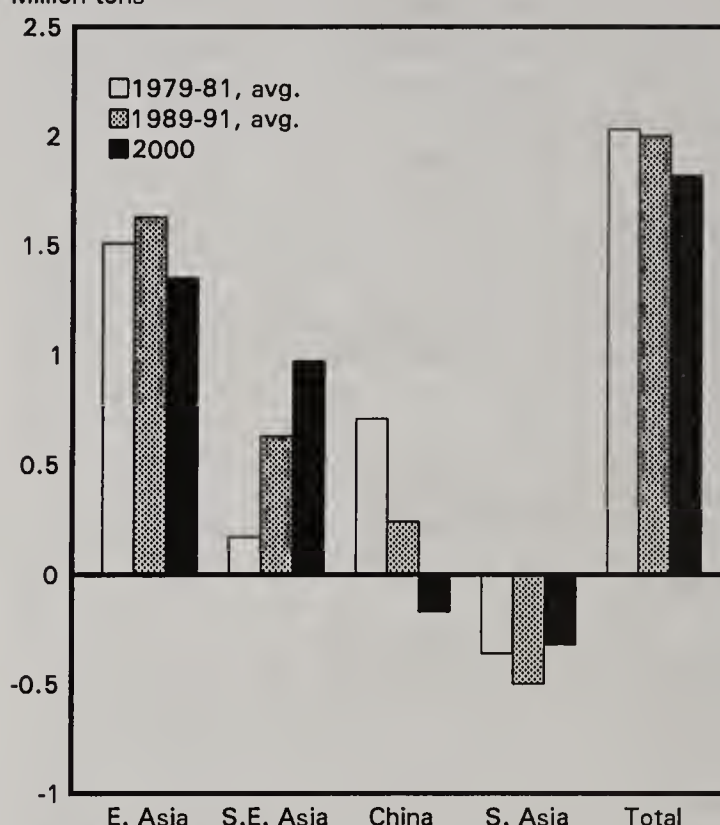
	1979- 1981 avg.	1989- 1991 avg.	2000	Growth rates ----- 1980-90 1992-00	
	-----Million tons-----			---Percent---	
Cotton					
Area(Mil. ha)	15.1	16.0	17.3	.6	.8
Yield(Kg/ha)	.32	.53	.63	5.3	1.7
Production	4.8	8.5	11.0	5.9	2.5
Imports	2.4	2.7	2.5	1.1	-.8
Exports	.4	.7	.7	6.4	-.3
Consumption	6.7	9.7	13.7	3.8	3.5

Includes: China, India, Indonesia, Hong Kong, Japan, Pakistan, South Korea, Taiwan and Thailand.

Figure O-8

Asia: Net Imports of Cotton by Subregion

Million tons



Note: Negative numbers denote net exports.

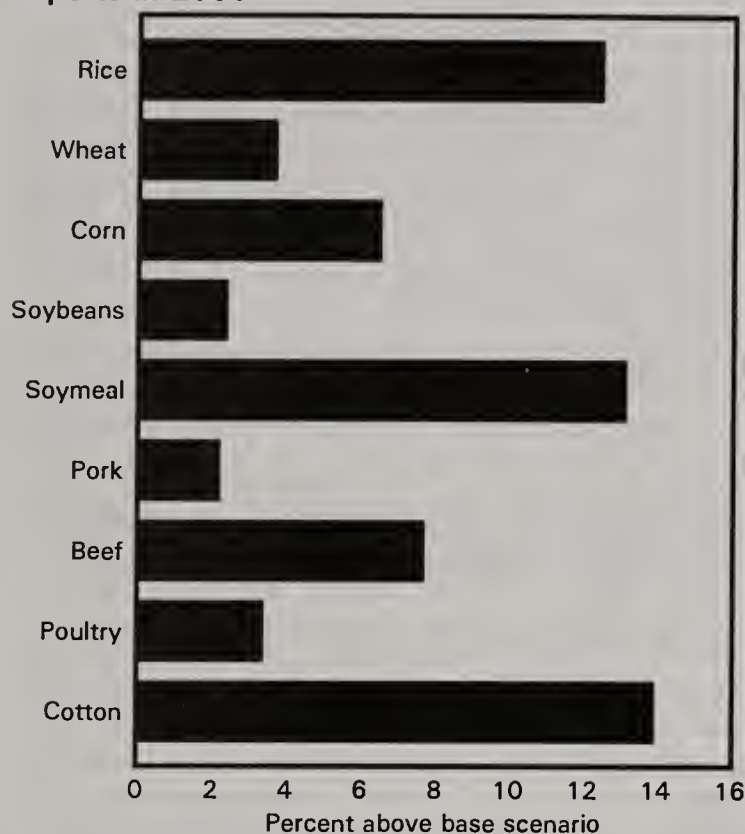
- Southeast Asia had the region's strongest import growth in the 1980's, as low costs relative to East Asia led to rapid growth in textile processing to meet domestic and export demand. Import demand is projected to remain strong in the 1990's, but actual growth may hinge on future negotiations with importers on quotas under the MFA.
- China is projected to sustain rapid, possibly accelerating, growth in cotton use to meet both domestic and export demand. At the same time, constraints on area and further yield gains may slow growth in domestic supply. Current raw cotton surpluses are projected to decline, with some scenarios indicating a possible shift to a net import position for raw cotton by 2000.
- South Asia, primarily Pakistan and India, achieved rapid growth in production and use of raw cotton, and in exports of textiles, during the 1980's. Output growth is projected to slow in the 1990's, but remain strong. Raw cotton exports are not projected grow, but could rise if MFA quotas or other factors impede expansion of textile exports.

Key Issues in the Trade Outlook

The country studies in this report emphasize several factors as keys to the long term outlook. These include: prospects for income growth, the dynamics of consumer food demand, potential unilateral reform of agricultural policy, and expected trends in agricultural productivity. The projections for each region are sensitive to assumptions made on these and other factors. While the projections are based on expected developments, the analyses provide insight on the impacts of alternate assumptions.

Figure O-9

Asia: Impact of Income Growth on Projected Imports in 2000



Note: Impact of 1-percent higher annual real GDP growth during 1993-2000.

Income Growth

The relatively strong past growth in Asia's farm imports has been driven, in large part, by strong income growth. The income growth rates used in the base projections (see Box 1) indicate continued strong economic expansion in the region, although generally at a slower pace than in the 1980's. Given uncertainty about future global and regional economic trends, it is important to analyze the implications of alternative rates of growth.

Most of the country studies analyze the impact of a 1-percent increase in annual income growth above the base assumption during 1993-2000. Income changes usually have symmetrical impacts, so these results also infer the impact of slower growth. Figure O-9 shows the trade impacts across commodities. Across the range of commodities a 1-percent change in annual income growth leads to a 3- to 14-percent change in projected annual imports by 2000. As may be expected, corn, beef, and soymeal are relatively responsive, reflecting the impacts of income growth on feed demand and, with more liberal meat import policies, on East Asian beef demand.

For rice, the estimated trade impact of higher income growth is probably larger than would actually occur, largely because price effects have not been fully accounted for. In the thinly traded world rice market, the estimated increase in rice imports would likely boost trade prices, leading to higher production and reduced demand in the importing countries. The large percentage shift in cotton imports is driven by the results for China, where income effects are estimated to be large. In general, however, cotton import demand is only partially

Table O-5. Asia: Impact of income growth on projected imports in 2000 by subregion

	E. Asia	SE. Asia	China	S. Asia
-----Percent change-----				
Rice	-2.6	24.5	.0	17.0
Wheat	.4	6.6	10.8	15.9
Corn	1.6	16.2	105.4	118.8
Soybeans	1.8	4.7	.0	.0
Soymeal	1.5	5.8	**	**
Cotton	.0	2.9	296.1	.0
Meats	4.8	.0	.0	.0

** incalculable value. Imports rise from zero to 0.53 for China and from zero to 0.31 for S. Asia.

driven by consumer demand in the Asian countries, and may be more sensitive to incomes and trade policies outside Asia.

Table O-5 indicates that the income effects vary considerably across subregions. Therefore, the sensitivity of future import demand to changes in income growth depends on what countries grow faster or slower than the base assumption, and on the commodity. Imports of food and feed grains are most sensitive to economic growth in China and South and Southeast Asia. Demand for feeds is particularly sensitive to income growth in outside East Asia, although the absolute amounts of additional feed demand are relatively small compared with East Asia. Demand for meats is sensitive primarily to income growth in East Asia (Japan and the NIC's).

The income effects largely reflect the familiar pattern of income elasticities of demand across countries at different stages of development. In lower income areas, relatively large shares of additional income go for food. At higher income levels, smaller shares of additional income are spent on food, but diets consist of more higher-value foods, particularly livestock products. Increased livestock product demand, in turn, boosts demand for feeds used in livestock production. For Asia, the results show that economic growth in lower income regions will be a major determinant of the demand for food and feed imports. However, the results also suggest that the link between growth and farm trade observed in East Asia may not be as strong in other parts of the region. Deviations from the East Asia pattern may stem from differences in consumer behavior, farm policies, and agricultural resources.

East Asian Demand for Processed Agricultural Products

Although growth in import demand is projected to be slower than elsewhere in Asia, East Asia will continue to account for a dominant share of Asia's farm imports. Future imports will be driven primarily by demand for processed farm products, rather than bulk, unprocessed commodities. Meats will account for a major share of such imports, but other commodities not covered in this study, including fresh and processed fruits

and vegetables, beverages, and tobacco products, will also be important. Key factors affecting this shift in the composition of demand and trade are:

- East Asia's relatively high incomes are leading to more diversification of diets towards meats and other processed goods.
- Policy changes induced by pressure from trade partners and from environmental concerns are slowing domestic livestock production, thus shifting import demand from bulk feeds to meats and other livestock products.
- Liberalization of domestic and trade policies affecting some bulk commodities, particularly rice, is unlikely without a multilateral agreement.

The analysis shows that trade growth will be sensitive to alternative plausible assumptions on shifts in consumer preference and government policy. With regard to consumer tastes, it is unclear how quickly traditional diets will shift to include more meats and other processed farm products common in western diets. In Japan for example, the projections assume that, based on recent trends, growth in meat use will begin to slow from the pace of the 1980's. This assumption is controversial, however, and faster or slower growth in meat demand will affect future meat imports.

Although East Asian import restrictions on rice and other crops are unlikely to ease outside a GATT agreement, domestic and external pressures have altered policies affecting feed and meat trade. To a great extent, the projected growth in meat imports hinges on assumed future policy developments. For example, the projections assume declining meat self-sufficiency in Japan and declining pork exports by Taiwan, but no further reform of Korean meat imports. Alternate scenarios find significant impacts on meat and feed imports relative to the base projections if Japan opts to maintain the current rate of meat self-sufficiency, if Korea further liberalizes imports, or if Taiwan limits pork output to domestic needs.

Income Growth and Policy Change in China

Rising wheat imports and declining exports of other bulk commodities by China are key features of the Asian trade outlook. China is also a key source of uncertainty in the outlook because of its size and the sensitivity of the projections to alternate assumptions on economic growth, policy, consumer preferences, and farm productivity. It seems clear that expanding demand and emerging supply constraints will boost imports of some commodities and reduce surpluses of others, but the pace of change is hard to predict in the context of rapid change in policies and economic structures. Alternate assumptions on the impacts of economic growth and reform suggest potential for significant imports of major bulk commodities by 2000. Key issues in the China outlook are:

- Changing policies, rapid income growth, and poor historical consumption and price data add to the uncertainty in projecting food demand. The use of demand parameters

based on the Taiwan experience in an alternate scenario leads to significantly different demand projections, particularly for wheat, corn, and soybeans.

- The Government is expected to respond to changes in food demand and reallocate land resources to minimize imports. This implies shifting land from rice to corn, oilseeds, and cotton, and boosting output of livestock products. If policies do not evolve in this way, impacts would include significantly higher exports of rice and, possibly, imports of corn, soybeans, or cotton.
- Policy change and uncertain scope for additional exploitation of land and water resources add to uncertainty in crop yield projections. Yield growth is expected to slow because of relatively high current yields, but major shifts in incentives could spur investment in new technology. Future wheat, corn, soybean, and cotton trade are all sensitive to plausible alternative productivity assumptions.

Market Potential and Competition in Southeast Asia

Southeast Asian countries are expected to sustain rapid income growth during the 1990's, creating the potential for farm import demand in this region to compensate for slowing demand in East Asia. Southeast Asia's farm imports are projected to expand faster than East Asia's in the 1990's. Limited capacity to produce wheat, feed protein, and cotton will strongly link economic growth and import demand. However, Southeast Asia's greater capacity to produce feed grains, edible oils, and meats will likely prevent the strong growth-trade link that occurred earlier in East Asia, as well as sustain the region's competitiveness in world markets for rice, edible oils, meats, and various tropical products. Major issues in the outlook are:

- Feed import demand is particularly hard to project because of rapid feed-livestock sector growth, domestic feed grain production potential, and poor data. The presence of corn, cassava, and other feeds suggests that corn imports may not show the same fast growth as in East Asia, but capacity to produce quality feed protein appears limited.
- Agriculture tends to be less protected in Southeast Asia than in East Asia. Some sectors—soybeans and sugar in Thailand and Indonesia and rice in Malaysia—are protected and reforms would tend to increase import demand. Other sectors, however, are now taxed and policy change will likely raise domestic prices and output and reduce import demand. In Indonesia, for example, raising rice and corn prices towards import parity is likely to prevent rice imports and generate corn exports.
- Crop yields, particularly for rice and corn, are relatively low in Southeast Asia, making future output potentially sensitive to policies to enhance productivity. Thai rice yields are among the lowest in Asia, and small increases in input use could have a large impact on export supply. In Indonesia and the Philippines, low corn yields could respond to improved incentives and institutional support, raising exports or reducing imports.

Agricultural Development and Policy in South Asia

South Asia's agricultural imports are projected to grow faster than those of East or Southeast Asia, but remain small relative to the other Asian subregions. Despite strong economic expansion and a vast population, farm imports remain relatively small because of low per capita incomes, farm resources will support higher production, and balance of payments constraints limit imports of consumer goods. South Asia is projected to be a growing importer of wheat and edible oils, but a growing net exporter of rice and oilmeals, as well as textiles based on domestically-produced cotton. To a great extent, South Asia's trade outlook hinges on the pace of policy change and development of farm infrastructure.

- Most agricultural production in South Asia is taxed rather than protected. Uncertainty centers on the extent to which policies will allow domestic prices to rise—hence reducing imports and raising exports. In India, a more aggressive move towards world prices could generate significant exports of rice, wheat, and, possibly, corn. In Pakistan, however, tradeoffs between wheat and cotton production limit the potential to curb wheat imports by raising prices. India's oilseed sector, in contrast, now receives high protection. A reduction of support is expected to boost edible oil imports, but the projections are sensitive to the assumed pace of reform.
- Past agricultural growth in South Asia has benefited from investment in farm infrastructure, including irrigation, roads, and research. In the context of financial stress in the 1980's, it is unclear whether underlying rates of public and private farm investment were adequate to sustain growth in output. In India, the analysis suggests that sustained below-trend investment could significantly affect import demand for wheat and some other commodities in the 1990's.

U.S. Trade Prospects

The Asian outlook presents both opportunities and challenges for U.S. agricultural trade. Because Asia is the largest regional market for U.S. farm exports, the outlook for strong growth in import demand in the 1990's also suggests the potential to improve U.S. performance. Prospects are improved by projected growth in net demand for wheat, coarse grain, soybeans, cotton, and meats—all commodities for which Asian markets are crucial to U.S. exporters. However, the projections also identify important challenges.

One challenge involves the degree of uncertainty in the Asian outlook. For the last two decades, Asian import demand has been driven primarily by the stable growth path of the major East Asian markets. In the 1990's, however, growth may tend to be less stable. East Asian demand should continue to steady the market, but growth in Southeast Asia and China is likely to be less stable and less predictable. First, technical and policy developments in China—which accounts for the bulk of the region's projected import growth—are particularly difficult to predict, and are likely to remain so. Second, outside East Asia, both weather- and policy-induced changes in farm

Table O-6. Asia: U.S. market share by commodity and subregion

	Japan	NIC's	SE. Asia	China	S. Asia
	-----Percent-----				
Wheat					
1979-81	55.4	84.2	40.7	43.8	37.3
1988-90	50.0	58.4	30.2	40.7	56.9
Rice					
1979-81	2.9	36.8	8.2	.0	.0
1988-90	5.9	2.7	13.0	.0	.0
Coarse grain					
1979-81	72.9	60.4	14.7	78.1	59.4
1988-90	59.9	75.9	7.0	28.9	**
Oilmeal					
1979-81	58.4	9.8	5.2	.0	.0
1988-90	4.1	.0	8.1	56.3	4.4
Oilseeds					
1979-81	65.8	81.3	64.6	83.2	.0
1988-90	50.2	73.4	21.0	.0	.0
Cotton					
1979-81	41.5	64.2	49.6	43.1	22.8
1988-90	46.9	39.5	26.1	**	16.8
Live animals & meats					
1979-81	25.1	48.8	4.9	5.6	.0
1988-90	32.0	47.2	7.6	5.6	12.3

** denotes approximately 100 percent

Source: Food and Agricultural Organization of the United Nations and U.S. Bureau of the Census

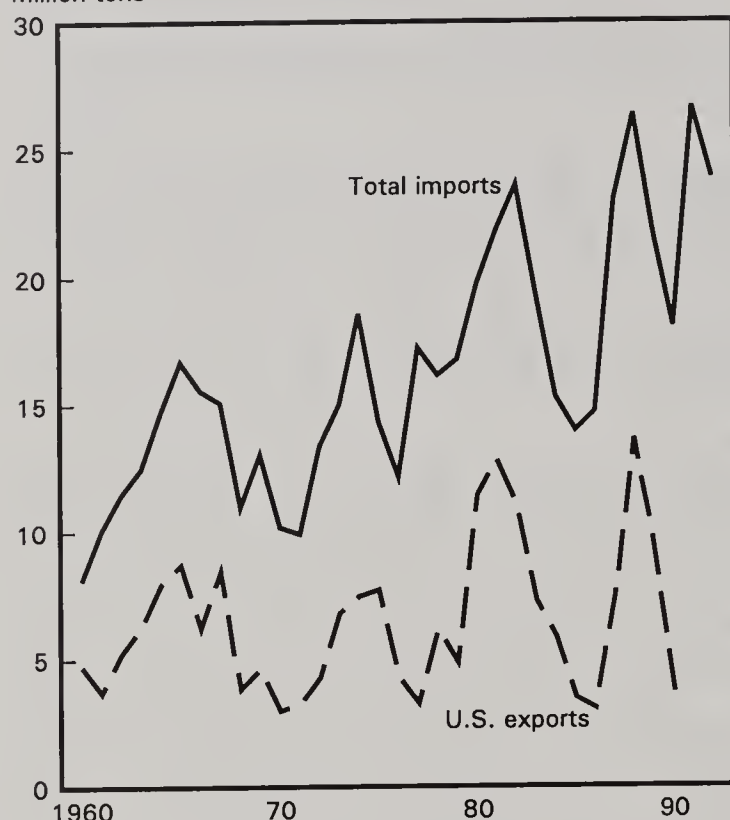
output have more potential to destabilize import demand. Differences in agricultural resources and policies will likely prevent many Asian countries from showing the strong and stable expansion of farm import demand observed in East Asia.

Another important challenge for U.S. trade is raised by historical U.S. market share performance across Asia (table O-6). U.S. market share tends to be relatively high in East Asian commodity markets, but relatively low in some Chinese and Southeast Asian markets that are expected to account for the bulk of future trade growth. Although U.S. share tends to be high for wheat and cotton, it has been relatively low for coarse grain, oilseeds, and meal in some regions that are projected to have relatively strong demand in the 1990's. Figures O-10 and O-11 further indicate that for two key commodities—wheat and coarse grain—U.S. market shares have been much less stable in Southeast Asia and China than in East Asia.

Figure O-10

Trends in Wheat Trade by China, Southeast Asia and South Asia

Million tons



Source: FAO and United Nations Trade Data Base

To the extent that relatively low U.S. market shares reflect a weakness in the ability to compete on the basis of price, terms, quality, or other factors, U.S. products may not be able to benefit from the anticipated growth in Asian demand. However, the relatively low current market shares in some markets probably also offer opportunities to expand U.S. sales faster than underlying growth in demand. The country studies identify two general issues in this regard:

- Raising or holding market share may entail aggressive marketing in what are now relatively small markets. Goals would be to ensure appropriate customer service and identify opportunities to apply U.S. export programs.
- Marketing and trade reforms are ongoing throughout China and South and Southeast Asia. These developments will require attentiveness to changes in trade policy and trading institutions, and to the needs and preferences of buyers within the new policy environment.

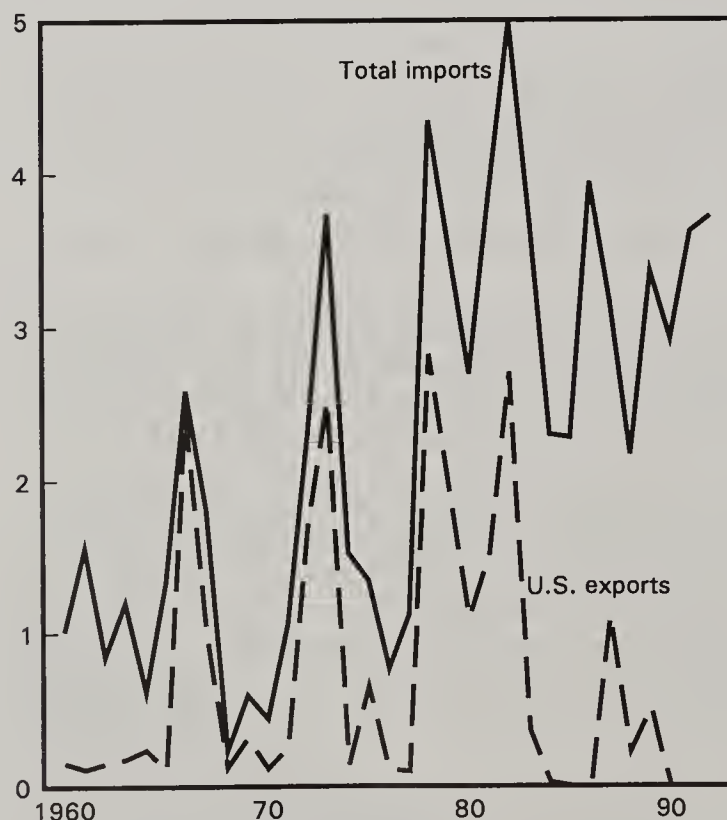
External developments that could significantly affect U.S. trade prospects in Asia include a potential GATT agreement or an Asian regional trade agreement involving agriculture. Market-oriented multilateral reforms under GATT would likely benefit U.S. farm trade by boosting imports by the major and relatively protected East Asian markets where U.S. market share is generally high. Elsewhere in Asia, where production tends to be taxed and consumption subsidized, direct impacts may be confined to a few sectors that are now protected, such as Indian oilseeds or Thai and Indonesian soybeans. In those areas where production is taxed, however, indirect impacts could include lower net imports or higher net exports of some commodities as internal policies adjust to increased world prices and market opportunities. Therefore, U.S. exports could face increased competition within the region for sales of corn, meats, cotton and, possibly, wheat.

Even in the absence of a GATT agreement affecting agriculture, Asian policies could be affected by a regional trade pact. An Asian regional trade agreement, perhaps involving broader commodity coverage and country participation under the current agreement of the Association of Southeast Asian Nations, could affect U.S. trade opportunities. Such an agreement may tend to reduce U.S. export opportunities for commodities produced by the participating countries. A pact involving East and Southeast Asian countries, though unlikely, could increase intraregional trade and reduce interregional trade in commodities such as rice, coarse grain, and meats.

Figure O-11

Trends in Coarse Grain Trade by China, Southeast Asia and South Asia

Million tons



Source: FAO and United Nations Trade Data Base

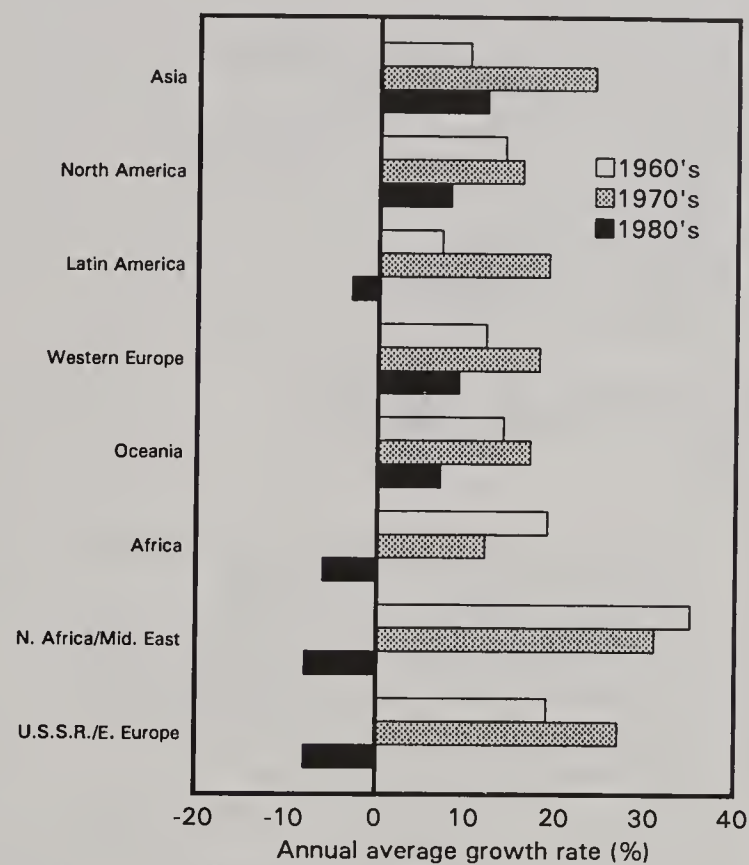
Changes in the Direction of Asia's Trade

A key uncertainty during the 1990's is the extent to which slow growth in the major developed countries will affect Asian economic performance. To a significant extent, income growth in Asian countries will depend on expanded exports. This should be particularly true in East and South-east Asia, where a relatively large share of domestic output is already destined for export markets. China and the South Asian countries tend to be less trade dependent, but export earnings may become increasingly important in financing debt and investment.

Recent trends in merchandise trade suggest that many Asian countries are becoming less dependent on sources outside the region for export growth and import supply. These shifts suggest that Asia may be able to maintain relatively strong economic growth during the 1990's, even if it remains weak in the developed countries of North America and Western Europe. Key trends include:

- North America and Western Europe remain vital trade partners, particularly for Japan. However, Asia provides the most important market for its own exports, a role that continues to expand.
- China, Southeast Asia, and the NIC's—the area's fastest growing subregions—tend to be heavily oriented towards Asian markets and suppliers.
- Asia's dependence on itself as a source of merchandise imports is expanding rapidly.
- Asian intraregional trade has expanded rapidly relative to other regions. Asia posted more rapid growth in intraregional trade than any other area in the 1980's, and most others in the 1970's.

Growth in Intraregional Merchandise Exports



Source: U.N. Trade Data Base

Changes in the direction of Asia's trade

Region	Asia		W. Europe		Mid. East		N. America		Other	
	1975	1988	1975	1988	1975	1988	1975	1988	1975	1988
Percent										
Destination of exports:										
Japan	26	29	14	22	8	3	25	39	27	8
NIC's	33	40	20	17	4	3	30	35	12	6
China	60	64	16	13	6	4	4	8	14	11
Southeast Asia	53	54	15	17	1	3	25	21	6	5
South Asia	22	24	23	30	19	9	11	19	24	18
Asia	34	38	16	19	7	3	24	33	20	7
Origin of imports:										
Japan	19	31	7	17	24	10	26	28	25	14
NIC's	44	54	13	14	13	5	21	20	8	7
China	42	48	28	20	2	1	12	16	17	15
Southeast Asia	43	48	20	20	9	5	17	19	11	9
South Asia	17	28	23	34	19	11	24	13	17	14
Asia	29	43	13	17	18	7	23	22	18	11

Source: Asian Development Bank; Government of Japan trade statistics.

List of Boxes

Box	Page
1. Economic Growth in Asia	19
2. Population Growth in Asia	26
3. Global Commodity Price Assumptions	37
4. Policy Intervention in Asian Agriculture	44
5. Diet Change in Asian Countries	58
6. Prospects for Myanmar's Rice Exports	69
7. Trends in Asian Demand for Rice and Wheat	81
8. Asian Feed Demand	92
9. Asia's Farm Markets	105
10. Relative Crop Yields in Asia	134
11. Changes in the Direction of Asia's Trade	161

List of Text Tables

Table	Page
A-1. Trends in total merchandise trade by world region	6
A-2. Agricultural imports by world region	6
A-3. Asia's farm trade by major commodity	7
A-4. U.S. total and agricultural exports by world region	9
A-5. U.S. farm exports to Asia by major commodity	10
A-6. Asian trade in food grains by subregion	12
A-7. Asian trade in feeds by subregion	13
A-8. Asian trade in live animals and meats by subregion	14
A-9. Trends in Asian meat trade	14
A-10. Asian trade in selected high-value products by subregion	15
A-11. Asian trade in cotton by subregion	16
A-12. Asian trade in vegetable oils by subregion	17
B-1. Bangladesh: Base projections for food grains	24
B-2. Bangladesh: Results of high income scenario	24
B-3. Bangladesh: Results of irrigation scenario	25
C-1. China: Base projections for crops	33
C-2. China: Base projections for livestock	34
C-3. China: Scenario results for crops	35
C-4. China: Scenario results for livestock	35
C-5. China: Estimated income elasticities under two scenarios	35
D-1. Hong Kong: Base projections for meats	41
D-2. Hong Kong: Base projections for grains	42
D-3. Hong Kong: Base projections for cotton	43
D-4. Hong Kong: Results of high-growth scenario	43
E-1. India: Trends in farm output	47
E-2. India: Composition of production growth for major crops	48
E-3. India: Trends in capital formation and agriculture's terms of trade	50
E-4. India: Base projections for grains	51
E-5. India: Base projections for oilseeds and products	52
E-6. India: Base projections for cotton	53
E-7. India: Base projections for animal products	54
E-8. India: Results of high income scenario	54
E-9. India: Results of grain policy reform	55
E-10. India: Results of oilseed policy reform	56
E-11. India: Results of investment scenarios	56
F-1. Indonesia: Trends in production of selected farm commodities	60
F-2. Indonesia: Trends in consumption of selected farm commodities	60

F-3.	Indonesia: Base projections for grains	64
F-4.	Indonesia: Base projections for oilseeds and products	65
F-5.	Indonesia: Base projections for cotton	66
F-6.	Indonesia: Results of high income scenario	66
F-7.	Indonesia: Results of rice yield growth scenarios	67
F-8.	Indonesia: Results of corn yield growth scenarios	67
F-9.	Indonesia: Results of rice price scenario	67
F-10.	Indonesia: Results of soybean price scenario	68
G-1.	Japan: Base projections for meats	74
G-2.	Japan: Base projections for milk and eggs	74
G-3.	Japan: Base projections for grains	75
G-4.	Japan: Base projections for oilseeds	76
G-5.	Japan: Base projections for meals	77
G-6.	Japan: Base projections for oils	77
G-7.	Japan: Base projections for cotton	78
G-8.	Japan: Results of high-growth scenario	79
G-9.	Japan: Results of pork/broiler constant consumption scenario	79
G-10.	Japan: Results of pork/broiler self-sufficiency scenario	80
H-1.	Malaysia: Base projections for crops	87
H-2.	Malaysia: Base projections for livestock	88
H-3.	Malaysia: Base projections for oilseeds and products	88
H-4.	Malaysia: Results of high income scenario	89
H-5.	Malaysia: Results of rice policy reform scenarios	90
H-6.	Malaysia: Impact of alternate logging rates	91
I-1.	Pakistan: Agricultural growth rates	95
I-2.	Pakistan: Crop yield comparisons	96
I-3.	Pakistan: Producer and consumer subsidy equivalents	96
I-4.	Pakistan: Base projections for crops	101
I-5.	Pakistan: Base projections for oilseeds and products	101
I-6.	Pakistan: Base projections for livestock	102
I-7.	Pakistan: Results of high income scenario	102
I-8.	Pakistan: Results of policy reform scenarios	103
I-9.	Pakistan: Production impacts of reduced irrigation supply	104
J-1.	Philippines: Macroeconomic indicators	106
J-2.	Philippines: Growth in agricultural production, consumption, and imports	107
J-3.	Philippines: Base projections for crops	111
J-4.	Philippines: Base projections for oilseeds and products	112
J-5.	Philippines: Base projections for pork	112
J-6.	Philippines: Results of high income scenario	113
J-7.	Philippines: Results of rice policy reform	113
J-8.	Philippines: Results of corn policy reform	114
J-9.	Philippines: Results of reduced irrigation expenditure	114
J-10.	Philippines: Results of higher corn yields	114
K-1.	South Korea: Base projections for meats	121
K-2.	South Korea: Base projections for milk and eggs	122
K-3.	South Korea: Base projections for crops	122
K-4.	South Korea: Base projections for oilseeds	123
K-5.	South Korea: Base projections for meals	124
K-6.	South Korea: Base projections for oils	124
K-7.	South Korea: Results of beef liberalization scenario	125
K-8.	South Korea: Results of high income scenario	126
L-1.	Taiwan: Trends in agricultural production	128
L-2.	Taiwan: Per capita consumption of major commodities	129
L-3.	Taiwan: Base projections for crops	131
L-4.	Taiwan: Base projections for oilseeds	132
L-5.	Taiwan: Base projections for meats	132

L-6.	Taiwan: Base projections for cotton	133
L-7.	Taiwan: Results of high-growth scenario	133
L-8.	Taiwan: Results of no-pork-exports scenario	133
M-1.	Thailand: Base projections for crops	140
M-2.	Thailand: Base projections for livestock	140
M-3.	Thailand: Base projections for oilseeds and products	141
M-4.	Thailand: Results of high income scenario	142
M-5.	Thailand: Trade impacts of changes in rice production	142
M-6.	Thailand: Results of soybean protection scenario	143
M-7.	Thailand: Results of swine scenario	143
N-1.	Vietnam: Summary of policy reforms since 1980	146
N-2.	Vietnam: Rice production performance	147
N-3.	Vietnam: Base projections for rice	148
N-4.	Vietnam: Scenario assumptions.	148
N-5.	Vietnam: Scenario results	148
O-1.	Asia: Food grain projections	152
O-2.	Asia: Feed projections	153
O-3.	East Asia: Meat projections.	155
O-4.	Asia: Cotton projections	156
O-5.	Asia: Impact of income growth on projected imports in 2000 by subregion	157
O-6.	Asia: U.S. market share by commodity and subregion	159

List of Text Figures

Figure		Page
A-1.	Growth of Agricultural Trade by World Region	7
A-2.	Growth in Asia's Farm Imports by Subregion	7
A-3.	Asian Shares of World Agricultural Imports	8
A-4.	Shares of U.S. Farm Exports by Destination	8
A-5.	U.S. Market Share in Asia.	8
A-6.	U.S. Market Share in Asia by Commodity Group	8
A-7.	Trends in Asian Agricultural Imports	11
A-8.	Asian Rice Imports and Exports.	12
A-9.	Asian Coarse Grain Imports and Exports.	12
A-10.	Asian Cotton Imports by Subregion	16
A-11.	Asian Edible Oil Imports and Exports	16
A-12.	Selected Asian countries: Per Capita U.S. Farm Exports vs. Income.	17
B-1.	Bangladesh: Rice Yields	21
B-2.	Bangladesh: Per-Capita Food Grain Consumption	22
B-3.	Bangladesh: Trends in Food Grain Ration Prices	22
B-4.	Bangladesh: Trends in Irrigated Area	23
C-1.	China: Growth of Real Per Capita GDP and Farm Income.	28
C-2.	China: Retail and Procurement Food Price Indices	30
C-3.	China: Producer Subsidy Equivalents by Major Commodity	30
C-4.	China: Consumer Subsidy Equivalents by Major Commodity	31
D-1.	Hong Kong: Trade with Major Partners, 1991.	39
E-1.	India: Fiscal and Current Account Balance	46
E-2.	India: Producer Subsidy Equivalents by Major Commodity (1982-90 Average).	47
E-3.	India: Trends in Producer Subsidy Equivalents	47
E-4.	India: Trends in Input Subsidies for Major Commodities	48
E-5.	India: Consumer Subsidy Equivalents by Major Commodity (1982-90 Average).	49
E-6.	India: Trends in Irrigated Area	50
F-1.	Indonesia: Trends in Real Wholesale Prices	61
F-2.	Indonesia: Trends in Irrigated Area	63
F-3.	Indonesia: Rice Yields.	63

G-1.	Japan: Caloric Intake Per Day.....	71
G-2.	Japan: Beef and Veal Supply and Use	74
G-3.	Japan: Pork Consumption and Imports.....	74
G-4.	Japan: Poultry Consumption and Imports	75
G-5.	Japan: Oilseed Consumption.....	76
G-6.	Japan: Coarse Grain Consumption and Feed	76
G-7.	Japan: Wheat Imports	78
G-8.	Japan: Rice Consumption and Stocks.....	78
G-9.	Japan: Cotton Consumption	78
H-1.	Malaysia: Area Devoted to Tree Crops.....	84
H-2.	Malaysia: Per Capita Grain Consumption	85
H-3.	Malaysia: Soy Product Imports.....	89
H-4.	Malaysia: Rice Production Scenarios	90
I-1.	Pakistan: GDP Growth and Investment	94
I-2.	Pakistan: Trends in Inflation and Deficits	95
I-3.	Pakistan: Trends in Administered and Open Market Wheat Prices.....	97
I-4.	Pakistan: Trends in Government Wheat Operations	97
I-5.	Pakistan: Trend in Irrigated Area	100
J-1.	Philippines: Consumer Prices Relative to Border Prices.....	109
J-2.	Philippines: Real Consumer Prices.....	109
K-1.	South Korea: Beef Consumption and Imports	121
K-2.	South Korea: Coarse Grain Consumption and Feed	123
K-3.	South Korea: Oilseed Consumption	123
K-4.	South Korea: Wheat Consumption and Feed	124
K-5.	South Korea: Rice Consumption and Stocks	125
K-6.	South Korea: Cotton Consumption.....	125
M-1.	Rice Yields of Major Producers	138
N-1.	Vietnam: Rice Export Scenarios	149
N-2.	Rice Exports, Selected Major Traders	149
O-1.	Asia: Growth Rates of Net Imports by Commodity.....	151
O-2.	Asia: Net Imports of Wheat by Subregion.....	152
O-3.	Asia: Net Imports of Rice by Subregion	152
O-4.	Asia: Net Imports of Coarse Grains by Subregion	153
O-5.	Asia: Net Imports of Soybeans by Subregion	154
O-6.	Asia: Net Imports of Soymeal by Subregion	154
O-7.	Asia: Net Imports of Edible Oil by Subregion.....	155
O-8.	Asia: Net Imports of Cotton by Subregion	156
O-9.	Asia: Impact of Income Growth on Projected Imports in 2000	157
O-10.	Trend in Wheat Trade by China, Southeast Asia, and South Asia	160
O-11.	Trend in Coarse Grain Trade by China, Southeast Asia, and South Asia.....	160

United States
Department of Agriculture
1301 New York Avenue, NW
Washington, DC 20005-4789

OFFICIAL BUSINESS
Penalty for Private Use, \$300

BULK RATE
POSTAGE & FEES PAID
U.S. Dept. Agriculture
PERMIT NO. G-145

Moving? To change your address, send this sheet with label intact, showing new address to: EMS Information, Rm 228, 1301 New York Ave., NW, Washington, DC 20005-4789

ERS also issues an annual assessment of developing countries' short-term cereal food aid needs. The 1993 issue, *Food Aid Needs Assessment*, will be published in December 1993. The 1992 issue, *Global Food Assessment*, is available now. Ask for GFA-3.

Call 1-800-999-6779 to order

